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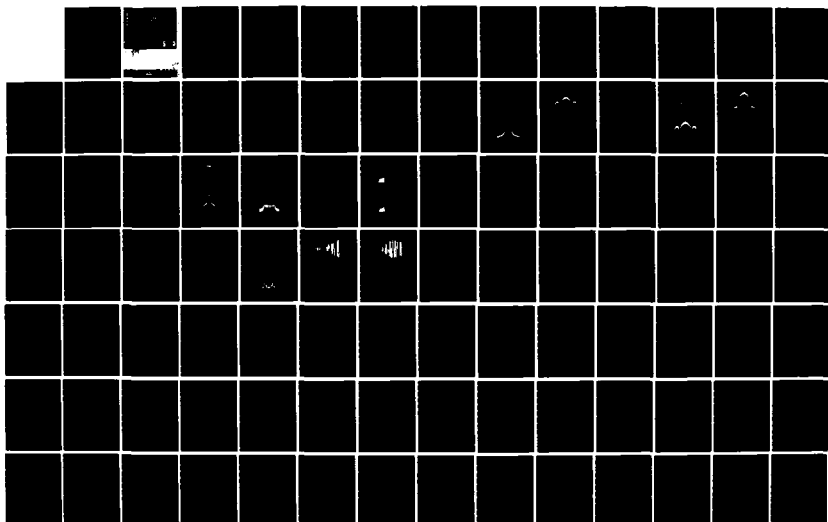
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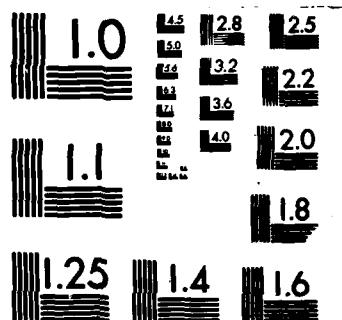
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**FLEXIBLE SATELLITE COMMUNICATIONS
SYSTEMS SIMULATOR**

PHASE III — FINAL REPORT

**PREPARED FOR
THE DEFENSE COMMUNICATIONS AGENCY
WASHINGTON, D.C.**

**UNDER
CONTRACT DCA100-77-C-0020**

MAY 1985

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PHASE III — FINAL REPORT

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MAY 1985

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TABLE OF CONTENTS

<u>Section 1 - Introduction and Summary.....</u>	1-1
<u>Section 2 - Reference Documents.....</u>	2-1
<u>Section 3 - Description of Phase III Enhancements.....</u>	3-1
3.1 Introduction.....	3-1
3.2 Enhancements to the Input Process.....	3-1
3.3 Simulation Capabilities Enhancements.....	3-2
3.3.1 Time Required for a Simulation.....	3-2
3.3.2 Increased Range of Allowable Data Rates.....	3-2
3.3.3 Demodulator Signal-to-Noise Ratio Estimate.....	3-2
3.3.4 Sample Rate Adjustment in Frequency Sample Filters	3-3
3.3.5 Time-Windowed Measurement Capability.....	3-3
3.3.6 Output Process Enhancements.....	3-4
3.4 New Devices.....	3-4
3.4.1 PN and FH Spreaders.....	3-4
3.4.2 Remodulation in a Satellite Element.....	3-5
3.4.3 Convolutional and Block Interleavers.....	3-5
3.4.4 Convolutional and Block Deinterleavers.....	3-5
3.4.5 Poles and Zeros Filter.....	3-5
3.4.6 Atmospheric Effects.....	3-6
3.4.7 Soft-Decision Viterbi Decoding.....	3-6
3.4.8 Phase Noise Generator.....	3-6
3.4.9 Time Sample Storage and Reuse.....	3-7
3.4.10 Nuclear Effects.....	3-7
3.5 Documentation Updates.....	3-7
<u>Section 4 - FSCSS Phase III Acceptance Tests.....</u>	4-1
4.1 Introduction.....	4-1
4.2 PN and FH Spreaders and Despreaders (Test 2).....	4-2
4.3 Poles and Zeros Filters (Test 3).....	4-3
4.4 Block Interleavers (Test 4).....	4-9
4.5 Synchronous Interleavers (Test 5).....	4-9
4.6 Soft Decision Viterbi Decoding (Test 7).....	4-9
4.7 MSK Soft Decision Decoding (Test 8).....	4-10
4.8 Oscillator Phase Noise (Test 9).....	4-17
4.9 Remodulation (Test 10).....	4-22
4.10 Atmospheric Effects (Test 11).....	4-22
4.11 Nuclear Effects (Test 12).....	4-25
4.12 MSK Modulators and Demodulators (Tests 7 & 8 of Phase II).....	4-27
<u>Section 5 - Conclusions.....</u>	5-1
<u>Appendix A -Acceptance Test Data Sheets.....</u>	A-1
<u>Appendix B - Acceptance Test Device Parameters.....</u>	B-1

LIST OF ILLUSTRATIONS

4-1	Narrowband BPSK Signal.....	4-4
4-2	FH Spread Spectrum Signal.....	4-4
4-3	DS Spread Spectrum Signal.....	4-5
4-4	CSER Output.....	4-6
4-5	FFT for FH after P-Z Filter.....	4-7
4-6	FFT for PN before P-Z Filter.....	4-7
4-7	FFT for PN after P-Z Filter.....	4-8
4-8	CSER: PN Channel.....	4-8
4-9	Block Diagram for Soft Decision Decoding Tests....	4-11
4-10	Soft Decision Test PN-FH Spectrum.....	4-13
4-11	Soft Decision Test FH Spectrum.....	4-13
4-12	Soft Decision Test DPSK Spectrum.....	4-14
4-13	Soft Decision Test 8FSK Spectrum.....	4-14
4-14	MSK Soft Decision Decoding Configuration.....	4-15
4-15	Stored Spectrum.....	4-16
4-16	Composite Spectrum.....	4-16
4-17	PLL Model and Measurement Points.....	4-18
4-18	Phase Noise Test Results.....	4-21
4-19	CSER Measurement: Satellite Demodulator.....	4-23
4-20	CSER Measurement: Receive Earth Terminal Demodulator.....	4-23
4-21	Atmospheric Effects Debug Data.....	4-24
4-22	CIRF Amplitude Fading Plot.....	4-26
4-23	C.W. Test Spectrum before Nuclear Scintillation...	4-28
4-24	C.W. Test Spectrum after Nuclear Scintillation....	4-28
4-25	BPSK I&D Inphase Voltage.....	4-29
4-26	BPSK I&D Quadrature Voltage.....	4-30
4-27	BPSK Carrier Phase Plot.....	4-31

LIST OF TABLES

4-1	Results of Soft Decision Decoding Tests.....	4-12
4-2	Phase Noise Results.....	4-20
4-3	MSK Thermal Noise Results.....	4-32
5-1	SATCOM Features Modeled by FSCSS.....	5-2

SECTION 1 - INTRODUCTION AND SUMMARY

This FSCSS Phase III Final Report describes the work performed during Phase III of Contract DCA100-77-C-0020. The work reported here includes the implementation of additional features of the Flexible Satellite Communications Systems Simulator (FSCSS), the Phase III acceptance tests and the documentation of the FSCSS Version 3.0 software.

The work performed during Phase III falls into the following five categories:

- 1) Enhancements to the input process;
- 2) Addition of a color graphics capability;
- 3) Enhancements to the output process;
- 4) Simulation capabilities enhancements; and
- 5) New devices.

Additional keywords: digital simulation, digital computers, user friendliness, graphics terminals and printers
The main thrust of the enhancements to the input process was to improve the user-friendliness of FSCSS. This consisted of simplifying the process of creating and editing devices, elements and systems. A single edit command, rather than three separate commands, is now used. In addition, new subcommands were added to the element and system editing modes.

A Tektronix color graphics terminal and printer were purchased for FSCSS as part of the Phase III effort. Programs were written that provide the capability to produce block diagrams of elements and systems in the FSCSS data base. The capability to plot tabular output data from the FFT and demodulator measurement devices was also added.

Output was made into an independent process with its own data base. All output report processing is done at the FSCSS command/subcommand level, so the user no longer needs to use VAX commands. A report definition subcommand has been added through which the user can select or deselect the printout of reports from

measurement devices activated during run parameter specification. A plot subcommand is also available through which the user can obtain high resolution plots of any activated FFT or any of eight types of x-y plots for activated demodulator measurement devices.

Simulation capabilities enhancements were incorporated to reduce simulation execution time, increase the range of allowable data rates, extend the demodulator signal-to-noise ratio estimate capability to all demodulators, adjust the sampling rate in frequency sample filters so that all filter bandwidths are allowable, and provide a time-window capability for all measurement devices.

New devices were added to FSCSS and several existing devices were modified; namely:

1. PN and FH spreaders
2. Remodulation of signals demodulated in a satellite element
3. Synchronous and block interleavers
4. Synchronous and block deinterleavers
5. Poles and zeros filter
6. Atmospheric effects update
7. Soft-decision decoding extension to additional modulation schemes
8. Phase noise generator enhanced
9. Time sample storage and reuse
10. Nuclear effects

All these devices work except for minor problems in certain modes of operation of the interleavers and atmospheric effects devices. These will be analyzed and corrected during the maintenance phase of the contract. Problems left unresolved at the end of Phase II (e.g., phase noise effects) have been corrected. Section 2 lists the reference documents supporting this report. Section 3 describes the work accomplished under FSCSS Phase III and summarizes the results of engineering testing and the acceptance tests.

Section 4 presents and analyzes the results of the Phase III Stage 2 acceptance tests performed in the period March 18, 1985 to April 1, 1985 and is supported by Appendix A, which contains the data sheets filled out for each test and signed by witnessing DCEC and CSC personnel. The FSCSS devices, elements and systems used for all these tests are characterized in Appendix B.

Section 5 summarizes the state of FSCSS at the end of Phase III.

SECTION 2 - REFERENCE DOCUMENTS

This FSCSS Phase III Final Report is supported by the following references:

1. Flexible Satellite Communications Systems Simulator, Phase 1A Final Report, 1 July 1979.
2. Flexible Satellite Communications Systems Simulator, Phase II Interim Report, August 1983.
3. Flexible Satellite Communications Systems Simulator, Stage 2 Demonstration Plan, 8 July 1983.
4. Flexible Satellite Communications Systems Simulator, Demonstration 4 Report, August 1983.
5. Flexible Satellite Communications Systems Simulator, Demonstration 5 Report, March 1984.
6. Flexible Satellite Communications Systems Simulator, Phase II Final Report, March 1984.
7. Flexible Satellite Communications Systems Simulator, Phase III Communications Enhancement Design Plan, November 1984.
8. Flexible Satellite Communications Systems Simulator, Nuclear Effects Code Interface Report, October 1984.
9. Flexible Satellite Communications Systems Simulator, Users Guide, March 1984.
10. Flexible Satellite Communications Systems Simulator, Standard Device Groups, March 1984.
11. Flexible Satellite Communications Systems Simulator, Maintenance Manual, March 1984.

12. Paul, H. and Kullstam, P., "Effects of Phase Noise and Thermal Noise Upon Coherent PSK Demodulation ...," Task Order 0208, Contract DCA100-73-C-0008, August 1974.
13. Gardner, F.M., "Phaselock Techniques," Wiley, 1966.
14. Kullstam, P., "Comparison of Three Basic Methods to Operate in Presence of Doppler Stress...", Paper 74-438, AIAA 5th Communications Satellite Systems Conference, April 1974.
15. Final Report on Increased Channel Bandwidth Study, CDRL #A072, General Electric Company, March 1981.
16. Proakis, J.G., "Digital Communication," McGraw Hill, 1983.

SECTION 3 - DESCRIPTION OF PHASE III ENHANCEMENTS

3.1 INTRODUCTION

During Phase III various enhancements were made to FSCSS. The input and output processes were modified to provide improved user-friendliness and great flexibility. The simulation process was enhanced to reduce simulation run time and to provide expanded simulation capabilities and results. New devices were added to the modeling capabilities, and a color graphics system was incorporated that provides the capability for higher resolution plots of Fast Fourier transforms and x-y plots of demodulator statistics. These enhancements are described in the following paragraphs.

3.2 ENHANCEMENTS TO THE INPUT PROCESS

The FSCSS input process has been modified so that the single command EDIT is used for device, element and system creation. It is no longer necessary to use a different command (i.e., EDDV, EDEL, and EDSV). The EDIT command operand specifies which editing mode is to be entered. The element editing mode has also been expanded to provide the capability to create new devices while inserting or replacing devices.

A DRAW elements and systems command has been added that produces block diagrams on a color graphics terminal and printer. The screens have titles and subtitles, with system or element descriptor and the FSCSS entity name (e.g., SY45), respectively, as optional defaults. A default color scheme has been provided which the user can change using the graphics terminal function keys. The DRAW capability has also been provided as a subcommand in the element and system edit modes.

3.3 SIMULATION CAPABILITIES ENHANCEMENTS

3.3.1 Time Required for a Simulation

Simulation execution time is, among other things, a function of array processor memory size and the number of calls to the array processor. To reduce execution time, vector chaining of array processor commands was incorporated where applicable. Vector chaining reduces the number of calls to the array processor by sending certain array processor operations as a group in one call. In particular, this reduces the processing time of filters by a factor of two to four.

3.3.2 Increased Range of Allowable Data Rates

The FSCSS global sampling frequency is determined by the number of carriers included in a simulation, the bandwidth of these and the data rates. In turn, symbol rate divided by sampling frequency determines the number of samples per channel symbol. For the highest data rate in a configuration, this number must be at least equal to the minimum number of samples per symbol specified in the run parameters. For a lower data rate this number would be higher. In the Phase II FSCSS (Version 2.0), there was an upper limit on the number of samples per channel symbol. This limited the lowest data rate that could be simulated. The limit has been removed so that any data rate can be simulated.

3.3.3 Demodulator Signal-to-Noise Ratio Estimate

FSCSS contains a capability within the demodulator measurement device to estimate symbol error rate based on the signals at the detector output. This device calculates a running average of what might be termed the instantaneous error rate. At the end of a simulation, it produces a demodulator performance curve based on the addition of extra thermal noise to whatever degradation was present during the simulation. The algorithm used is not valid for other than white Gaussian noise interference. It

does, however, produce a reasonable performance estimate in a short simulation time (five or ten sample blocks). In contrast, the accurate measurement technique is to count bit errors, which may take many days of simulation time for an error rate of 1 in 10,000.

An additional capability to estimate signal and "noise" level at the demodulator input was implemented in all demodulators except APSK. The new algorithm bases these estimates on the mean and variance of the demodulator output signals. The agreement with measured bit error rates is much better with this new algorithm than with the old. For comparison, both old and new results are provided in the FSCSS "CSER" output.

3.3.4 Sample Rate Adjustment in Frequency Sample Filters

The FSCSS model for frequency sample (FS) filters is a finite impulse response algorithm. The user's 30 or fewer frequency domain points are extended across the full simulation bandwidth, and a z-transform is calculated. Storage is provided for only 500 points, which unrealistically limits the allowable lower bandwidth of the filter if the simulation bandwidth is high. To remedy this situation, a down-sampling technique has been incorporated. The sampling rate at the input to the filter is reduced by factors of two until it is just greater than the global sampling frequency (F_s) divided by four times the filter's 3-dB bandwidth ($F_s/4B$). This guarantees that the number of impulse response samples is 500 or less. The sampling rate is restored at the filter output by duplicating samples as necessary.

3.3.5 Time-Windowed Measurement Capability

All FSCSS measurement devices have been modified to provide time windows. Output reports may be produced for each window and for the entire simulation. Power meters can have up to ten windows, and the other measurement devices can have two.

3.3.6 Output Process Enhancements

The FSCSS output process has been reorganized so that all reports and plots are generated using FSCSS commands, rather than VAX command language. Upon completion, suspension or cancellation of a run, output data is automatically stored in the output data base labeled with a unique FSCSS run identifier. Using the OUTPUT command, the user can custom tailor the output reports to be printed or obtain reports for all measurement devices activated for that simulation. FSCSS diagnostic messages for the simulation can also be displayed.

Graphical output of the FFT and demodulator reports are obtained through the color graphics terminal and its associated printer. A plot definition subcommand is provided that allows the user to change plot colors, grid lines, title, and subtitle. Additionally, the frequency range of FFT plots can be varied to allow focusing on particular areas of the spectrum.

The nine types of plots that have been provided are:

1. FFT
2. Computed symbol error rate
3. Inphase channel voltage
4. Quadrature channel voltage
5. Symbol phase versus symbol count
6. Carrier phase versus symbol count
7. Phase error versus symbol count
8. Frequency estimate versus symbol count
9. Frequency rate estimate versus symbol count.

3.4 NEW DEVICES

3.4.1 PN and FH Spreaders

Pseudonoise (PN) and frequency hopping (FH) spreader devices were added that provide the capability to spread previously modulated signals. In the case of FH, orthogonal hopping was

added as an option in the spreader and desreader. In addition, the orthogonal hopping option was added to all FH and PN/FH modulators and demodulators.

3.4.2 Remodulation in a Satellite Element

The capability to remodulate a signal demodulated in a satellite element was incorporated. All modulators were modified to accept data bits output by demodulators, decoders and bit error rate counters.

3.4.3 Convolutional and Block Interleavers

Convolutional and block encoders capable of bit and symbol interleaving were added to FSCSS to operate with FSK modulators and demodulators. The block interleavers also have a block repetition option for up to 15 repetitions.

3.4.4 Convolutional and Block Deinterleavers

Convolutional and block decoders capable of bit and symbol deinterleaving for hard or soft decision decoding have been added to FSCSS. The FSK demodulator device was modified to output symbols or symbol voltages (for soft-decision decoding) which are passed on to the deinterleaver. For alphabet sizes greater than two, a symbol-to-bit converter must be used after the deinterleaver to convert the symbols to bits or bit voltages.

3.4.5 Poles and Zeros Filter

A poles and zeros filter device was added to model arbitrary filters and, in particular, elliptic filters. The poles and zeros are input by the user. The poles and zeros device uses these input values to calculate a residue for each of the pole locations. An existing FSCSS routine then uses the poles and residues to generate the recursive filter algorithm parameters that model the filter.

3.4.6 Atmospheric Effects

The atmospheric effects algorithms in FSCSS were updated with newer, more refined models. In particular, the rain attenuation model was changed. The new one includes depolarization losses in the rain attenuation calculation. An algorithm was also added to model the interference effects between links using orthogonally polarized antennas for frequency reuse. The atmospheric absorption model was changed to the new CCITT accepted model. Lastly, the atmospheric absorption, cloud attenuation, and rain attenuation algorithms were modified to accept elevation angles of less than six degrees.

3.4.7 Soft-Decision Viterbi Decoding

Soft-decision Viterbi decoding has been extended to DPSK, M-FSK, FH, PN/FH and MSK modulated signals. Briefly, the task consisted of modifying the demodulators to provide detector output voltages, and adding a symbol-to-bit converter device for 4-, 8- and 16-FSK. The function of the symbol-to-bit converter is to determine the most likely received symbol and then assign the demodulator output voltage to each of the bits of that symbol. The Viterbi algorithm decoder then performs soft-decision decoding on the bits.

3.4.8 Phase Noise Generator

The frequency translator phase noise generator was modified to accept up to 50 spectral points. In addition, an option has been provided whereby the user can enter the phase noise power spectrum coefficients (H_i) instead of the frequency samples, where the spectrum is given by

$$S(f) = H_0 + H_1/f + H_2/f^2 + H_3/f^3.$$

In this latter case, FSCSS calculates the 50 samples from the coefficients. The greater number of samples allows for a more

accurate representation of the spectrum both within and outside the bandwidth of a demodulator phase lock loop.

3.4.9 Time Sample Storage and Reuse

A device (KEEPSAMPLES) was added to FSCSS to save time samples of a composite signal in a disk file. In addition, the noise source device was expanded to accept external noise files. The saved samples can then be reused in simulations as noise sources -- signals not to be demodulated.

3.4.10 Nuclear Effects

An algorithm that models ionospheric scintillation disturbances caused by high-altitude nuclear detonations has been added to the FSCSS Propagation Anomalies device. The model, described in Reference 8, is based on L. Wittwer's Channel Impulse Response Function (CIRF).

3.5 DOCUMENTATION UPDATES

As part of the Phase III effort, the FSCSS User's Manual and the FSCSS Maintenance Manual were updated to reflect the new devices and enhancements. Final versions of the manuals were delivered in April 1985.

SECTION 4 - FSCSS PHASE III ACCEPTANCE TESTS

4.1 INTRODUCTION

This section describes the Phase III acceptance tests designed to demonstrate the correct operation of the Phase III enhancements as described in Reference 7. The tests fall into eight categories:

- Spreaders and Despreaders
- Poles and Zeros Filters
- Block and Synchronous Interleavers
- Soft Decision Viterbi Decoding for MSK, DPSK, FSK, FH and PN/FH
- Phase Noise Enhancements
- Storage and Reuse of Signal Samples
- Atmospheric Effects
- Nuclear Effects
- Execution Time Reduction

The input, output and simulation capabilities enhancements were demonstrated during the process of running the acceptance tests, rather than as separate tests. In particular, the plotting routines were used routinely in most tests to show FFT plots and demodulator performance. Element and system block diagrams obtained through the graphics terminal were used to illustrate the configurations being tested.

The following paragraphs present and analyze the results for all tests performed. Appendix A contains the test worksheets showing the configurations and the results. Each test sheet shows a block diagram, the major device parameters and how the required operating point was set. Appendix B contains device parameter sheets for each test configuration and includes block diagrams obtained using the DRAW command.

Two proposed tests were not run: one to demonstrate execution time speedup (Test 1), and the other to demonstrate synchronous interleaving/deinterleaving of a convolutionally encoded/soft-decision decoded data stream using FSK modulation (Test 6).

Test 1 was to consist of a rerun of the DEMO 5 system (Reference 5), which contains many vector chained devices (e.g., filters and limiters). Execution times measured for various phases of the run (device initialization and presimulation) would then be compared to times documented in Reference 5. Unfortunately, time did not permit reconstruction of this complex demonstration system; and another suitably benchmarked system was not available for comparison. However, based upon results of early tests of vector chained devices, execution times are notably faster, particularly in connection with filter devices. A three-to-one speedup was measured for a filter intensive configuration.

Test 6 was not run because of problems encountered in using interleavers with other encoders and decoders. Instead, soft-decision Viterbi algorithm decoding of FSK modulated signals was included as part of Test 7 (7D) in which soft-decision decoding was demonstrated for various modulation schemes.

4.2 PN AND FH SPREADERS AND DESPREADERS (TEST 2)

This test is intended to validate the simulation of PN and FH spreaders and despreaders. A BPSK waveform was used as the narrowband signal to be spread. This signal was then frequency hopped (spread) and direct sequence spread in the same transmit element using parallel transmission paths. Then, these waveforms were despread before being demodulated. A perfect, phase-coherent carrier reference was used, achieved by acquiring the reference using a noiseless preamble in the device initialization phase and then using a very narrow tracking loop bandwidth in the simulation phase.

The results of this test can be found on page A-1. The FFT measurements taken before spreading and after FH and DS spreading can be found in Figures 4-1 through 4-3. Figure 4-4 gives the CSER calculation for the PN demodulator. These figures show that FSCSS is accurately modeling both PN and FH spreaders. The spread spectrum bandwidth for both types of spreaders is as expected. It is proportional to the baseband bandwidth hopped over the number of cells specified for the FH spreader and to the chipping rate in the PN case. The FH spreader hopping cells were intentionally chosen wider than necessary so that the hopping of the BPSK signal would be clearly visible. Demodulation of the BPSK signals after despreading yielded the expected 0 bit error rates, indicating that the spreaders introduced no performance degradation and, thus, operate correctly.

4.3 POLES AND ZEROS FILTERS (TEST 3)

This test is intended to verify the operation of the FSCSS poles and zeros filter. This filter allows one to model an arbitrary filter by specifying normalized pole and zero locations, a 3-dB bandwidth, and the center frequency.

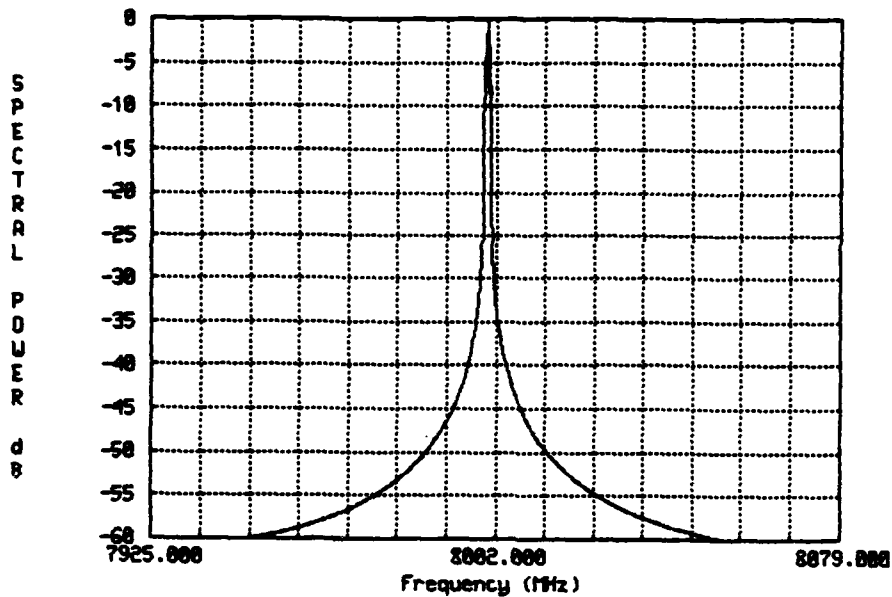
In order to verify correct operation of the filter, a poles and zeros (P-Z) filter was inserted into the wideband portion of the PN channel used in the previous test. This filter was modeled using pole and zero locations obtained from Reference 15, Case #211, and a 3-dB bandwidth such that all but the main lobe of the PN signal would be filtered out.

The results of this test can be found on page A-2. Figures 4-5 through 4-7 show the FFT plots, and Figure 4-8 shows the CSER measurements for the PN-channel BPSK demodulator.

Based on the above graphical output, there seems to be little doubt that FSCSS is accurately modeling P-Z filters. The rolloff and bandwidth of the filter agree with the general shape of the filter specified in the Reference 15.

8-FSK WITH SYMBOL INPUT AND SOFT DECISION DECODING

SY6, XT89, 18C1



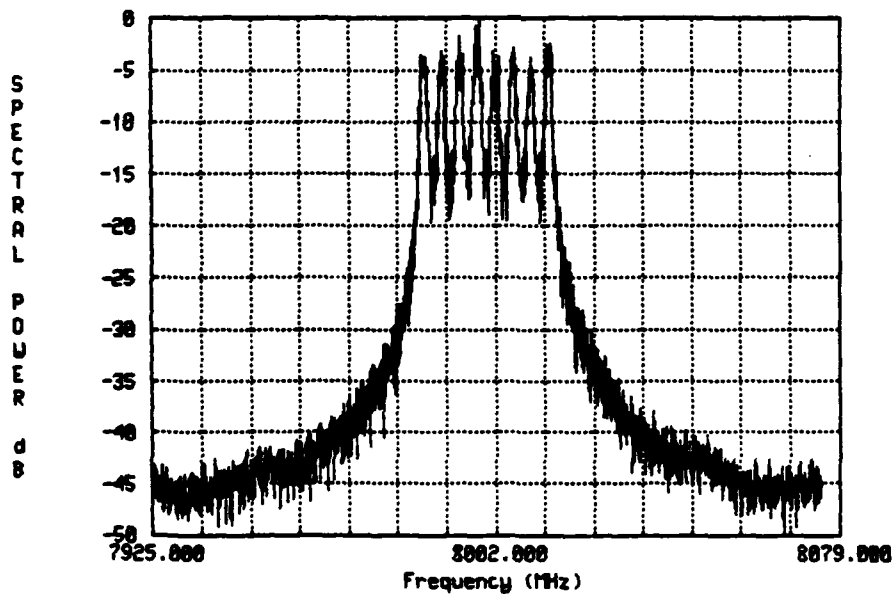
MAX POWER: -8.91 dBW
TOT POWER: -0.53 dBW

FSCSS RUN IDENTIFIER : S0680006

Figure 4-1. Narrowband BPSK Signal

8-FSK WITH SYMBOL INPUT AND SOFT DECISION DECODING

SY6, XT89, 28C3



MAX POWER: -18.92 dBW
TOT POWER: -0.53 dBW

FSCSS RUN IDENTIFIER : S0680006

Figure 4-2. FH Spread Spectrum Signal

8-FSK WITH SYMBOL INPUT AND SOFT DECISION DECODING

SY6, XT89, 18C3

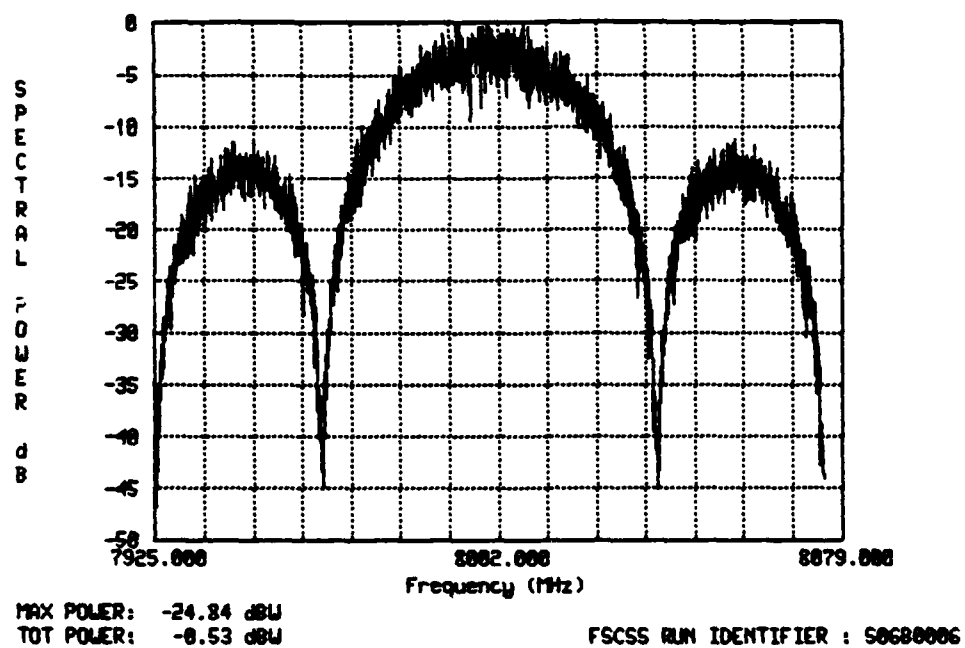
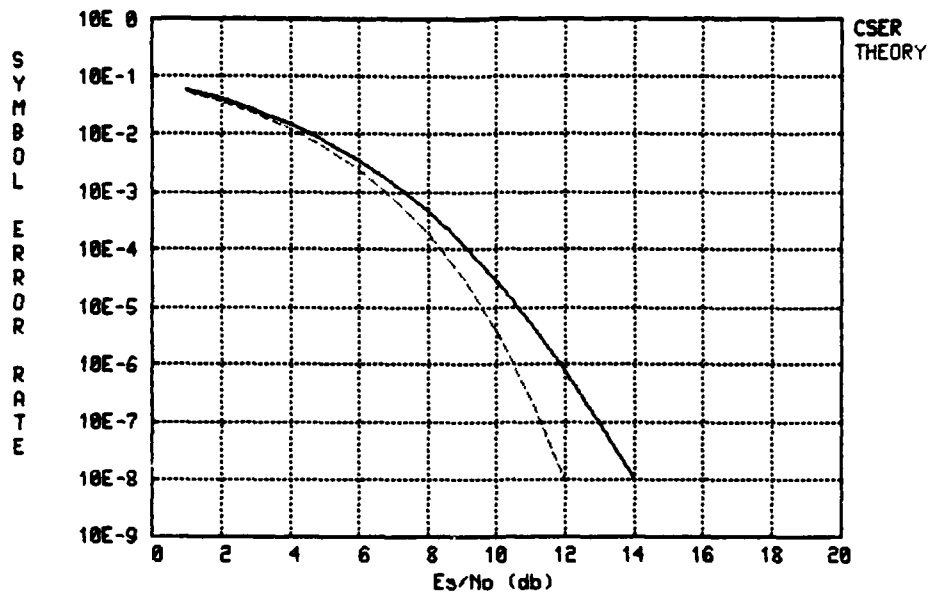


Figure 4-3. DS Spread Spectrum Signal

DEMOD - DA9 -- ACCEPT TEST 2: PN AND FH ON BPSK NO NOISE

SY6, XT89, 2BC6

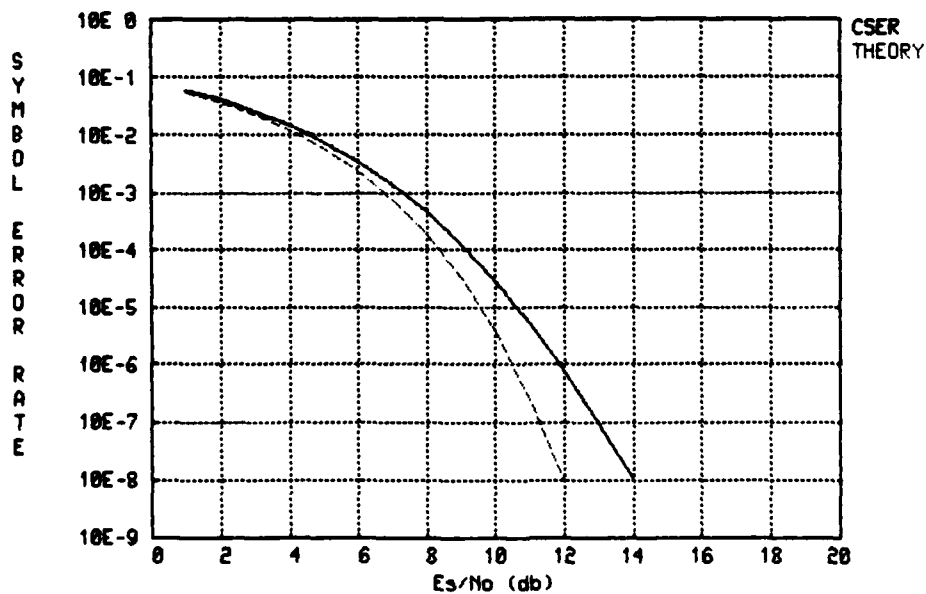


FSCSS RUN IDENTIFIER : S0680006

Figure 4-4(a). CSER Output

DEMOD - DA153 -- ACCEPT TEST 2: PN AND FH ON BPSK NO NOISE

SY6, XT89, 1BC6

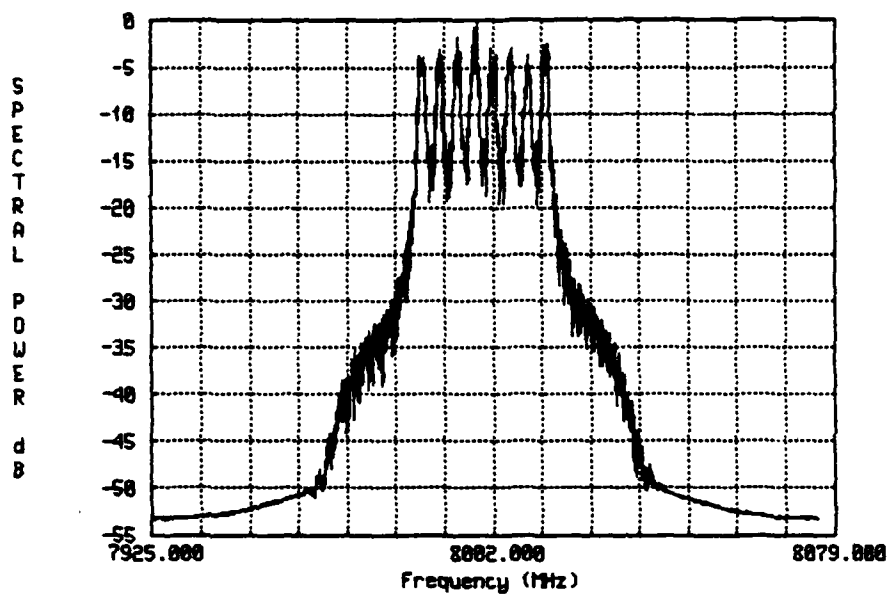


FSCSS RUN IDENTIFIER : S0680006

Figure 4-4(b). CSER Output

FFT - ZF1 -- ACCEPT TEST 3 POLES AND ZEROS FILTER.

SY60, XT169, 28C5



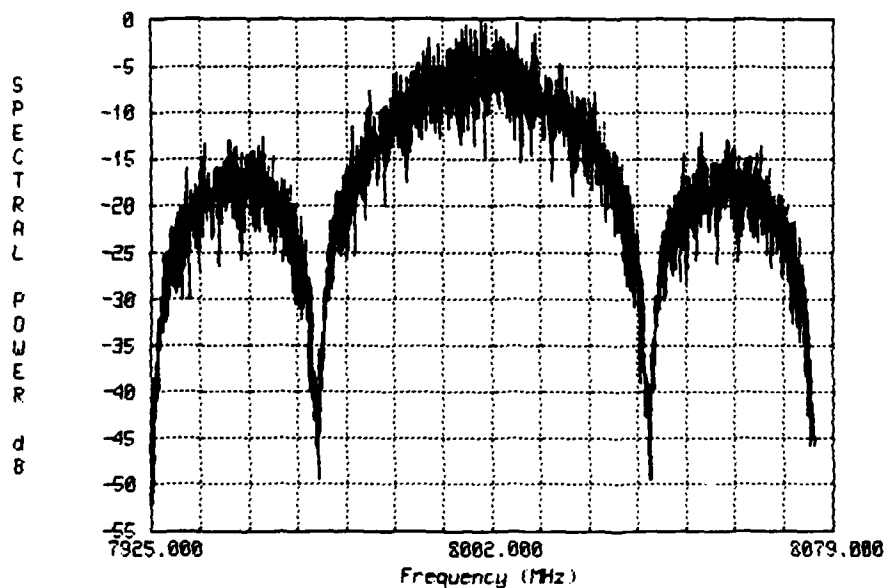
MAX POWER: -19.00 dBW
TOT POWER: -0.66 dBW

FSCSS RUN IDENTIFIER : S60C0006

Figure 4-5. FFT for FH after P-Z Filter

FFT - ZF1 -- ACCEPT TEST 3 POLES AND ZEROS FILTER.

SY60, XT169, 18C3



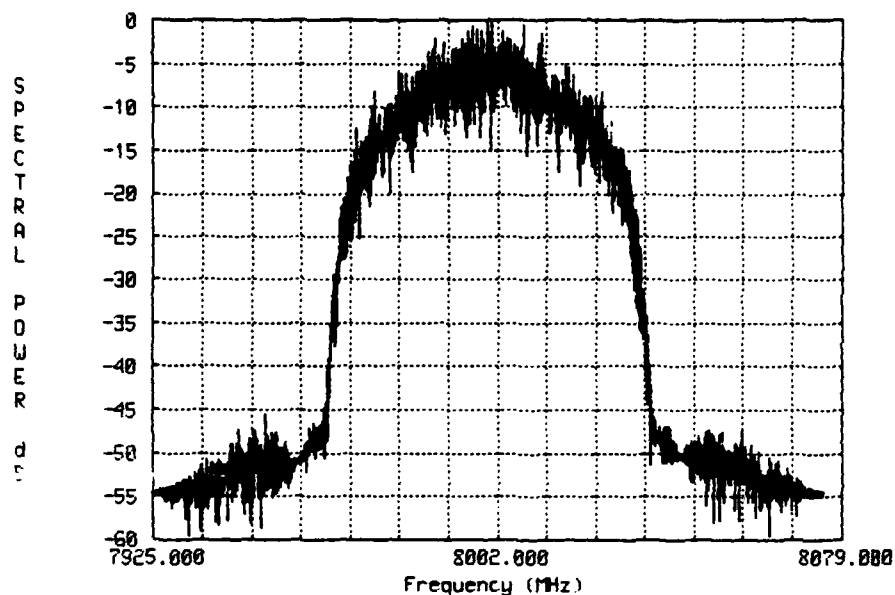
MAX POWER: -22.27 dBW
TOT POWER: -0.63 dBW

FSCSS RUN IDENTIFIER : S60C0005

Figure 4-6. FFT for PN before P-Z Filter

FFT - ZF1 -- ACCEPT TEST 3 POLES AND ZEROS FILTER.

SY60, XT169, 1BC5



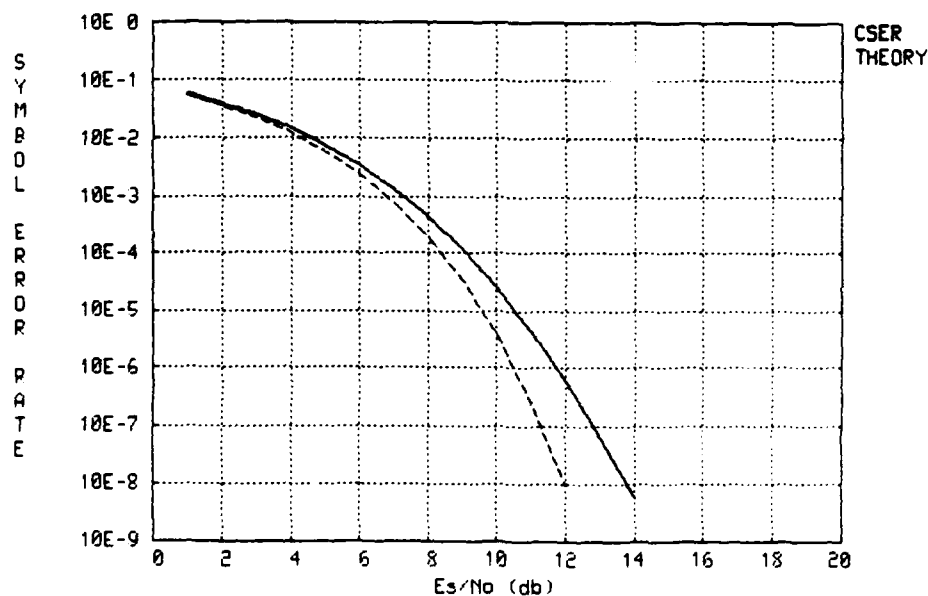
MAX POWER: -22.34 dBW
TOT POWER: -1.20 dBW

FSCSS RUN IDENTIFIER : S6080005

Figure 4-7. FFT for PN after P-Z Filter

DEM0D - DA153 -- ACCEPT TEST 3 POLES AND ZEROS FILTER.

SY60, XT169, 1BC8



FSCSS RUN IDENTIFIER : S6080005

Figure 4-8. CSER: PN Channel

4.4 BLOCK INTERLEAVERS (TEST 4)

The purpose of this set of tests is to verify the operation of the block interleavers with both bit and symbol inputs. Unfortunately, as discussed in Section 3, the block interleaver is not currently accepting symbol inputs. This situation will be corrected during the FSCSS maintenance phase.

The bit-input block interleaver test results are shown on page A-3. A small interleaver size (8x32) was chosen to minimize the FSCSS run time. The test configuration contained two Bit Error Rate (BER) counters -- one associated with the interleaver and one with the data source. Thus, the error rate out of the demodulator (due to the channel) could be verified as well as the error rate (end-to-end) of the entire configuration. The 0 BER measured in both cases indicates that the FSCSS block interleaver is working correctly for bit inputs and outputs (hard decision).

4.5 SYNCHRONOUS INTERLEAVERS (TEST 5)

The purpose of this set of tests is to verify the operation of the FSCSS synchronous interleaver. Again, a problem was uncovered with the use of symbols as input to the interleaver; therefore, only the bit (hard decision) test was run.

The results of this test can be found on page A-4. As with the block interleaver, two separate BER counters were used to verify the operation of the interleaver. The 0 Bit Error Rates measured at both locations indicate that the synchronous interleaver is performing as expected.

4.6 SOFT DECISION VITERBI DECODING (TEST 7)

This set of tests is intended to verify that the FH, PN-FH, DPSK and 8-FSK modems in FSCSS are now capable of passing soft-decision metrics to the Viterbi algorithm decoders.

Figure 4-9 shows the general test configuration used for this set of tests. The 8-FSK configuration is different in that: (1) a bit-to-symbol converter precedes the modulator to demonstrate symbol inputs to the modulator; and (2) a symbol-to-bit converter is used after the demodulator to convert the demodulator output symbol voltages to soft bits for use by the Viterbi algorithm decoder.

Test sheets and results are presented in pages A-5 through A-8. A summary of the test results is contained in Table 4-1 and FFT plots of the signal spectra are shown in Figures 4-10 through 4-13.

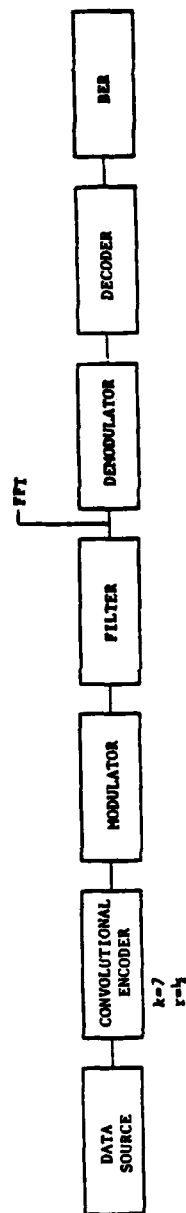
The Viterbi algorithm decoder was tested thoroughly during the Phase II acceptance tests. The intent of this set of tests is to demonstrate that the demodulators in question were correctly modified to pass soft bits (i.e., demodulator output voltages) to the Viterbi algorithm decoder. If this information is not passed correctly, decoding errors would be expected, even in the absence of thermal noise. The fact that no bit errors were detected indicates that the demodulators and symbol-to-bit converter are operating correctly.

4.7 MSK SOFT DECISION DECODING (TEST 8)

This test is intended to demonstrate two capabilities: soft-decision decoding for MSK demodulators, and the storage and reuse of time samples.

The test setup is shown in Figure 4-14. The DPSK, PN-FH and FH modulators used in the preceding set of tests were configured into a transmit earth terminal. The resulting composite signal was then transmitted to a satellite which contained a "Keep Samples" device. The resulting stored samples were then reused ("regenerated") in conjunction with an MSK signal.

The results of these tests are shown on page A-9. Figures 4-15 and 4-16 show the FFTs taken minus and with the MSK waveform. In order to simplify our testing, a "notch" was created



V.A. DECODER
 8 LEVEL (3 BIT) QUANTIZATION
 $\sigma^2 = 0.5$, VOLTAGE MEASUREMENT
 QUANTIZER
 METRICS: 0 1 2 3 4 5 6 7
 7 6 5 4 3 2 1 0

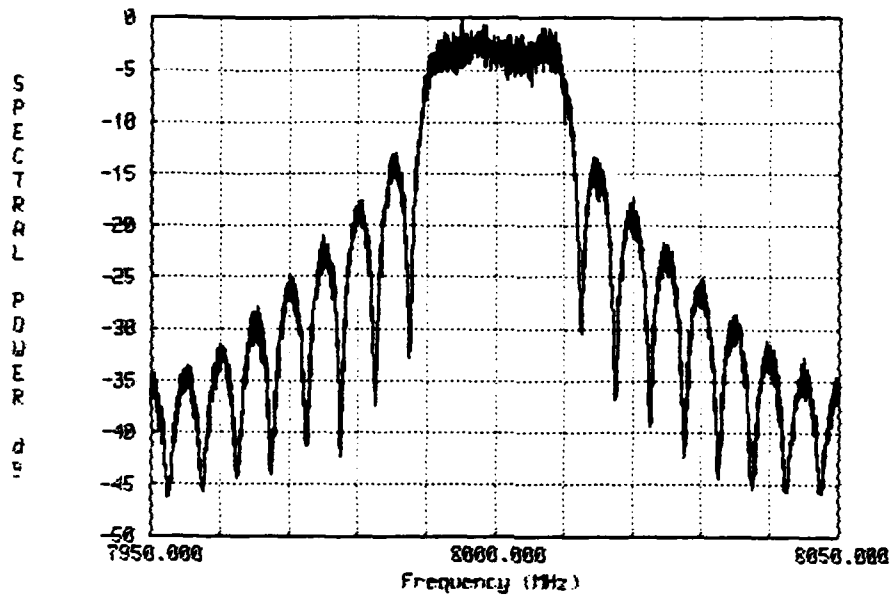
Figure 4-9. Block Diagram for Soft Decision Decoding Tests

Table 4-1. Results of Soft Decision Decoding Tests

MODULATION SCHEME	DATA RATE (kbps)	BER EXPECTED	BER OBSERVED
PN-FH	250	0	0
FH	250	0	0
DPSK	250	0	0
8-PSK	250	0	0
8-FSK	2.4	0	0

FFT - ZF1 -- TEST PN-FH SOFT DECISION DECODING

SY9, XT58, 1A86



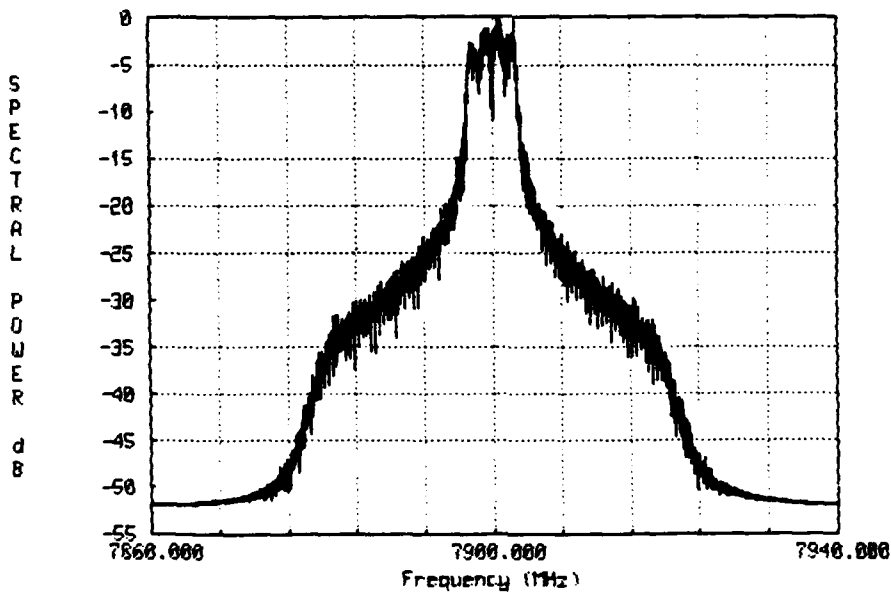
MAX POWER: -23.36 dBW
TOT POWER: -0.15 dBW

FSCSS RUN IDENTIFIER : S8960005

Figure 4-10. Soft Decision Test PN-FH Spectrum

FFT - ZF1 -- TEST FH SOFT DECISIONS

SY7, XT57, 1A86



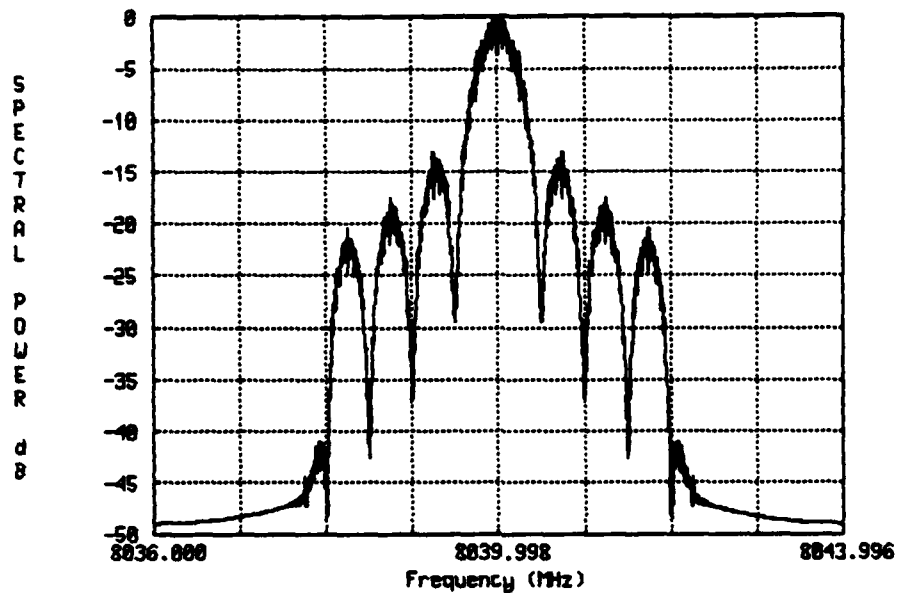
MAX POWER: -13.44 dBW
TOT POWER: -0.03 dBW

FSCSS RUN IDENTIFIER : S87E0006

Figure 4-11. Soft Decision Test FH Spectrum

FFT - ZF1 -- TEST OF DPSK SOFT DECISION DECODING.

SY18, XT98, 1A85



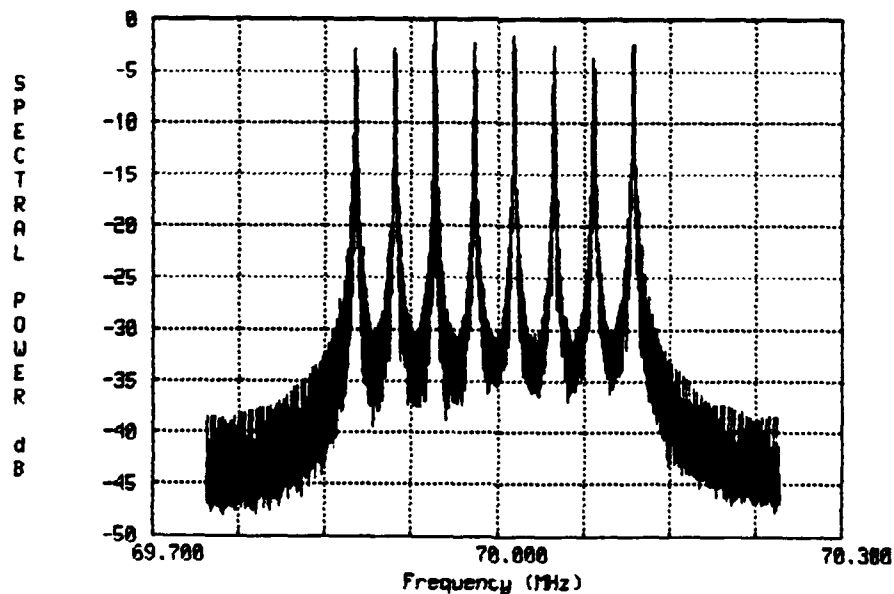
MAX POWER: -19.64 dBW
TOT POWER: -0.16 dBW

FSCSS RUN IDENTIFIER : S18D0001

Figure 4-12. Soft Decision Test DPSK Spectrum

8-FSK WITH SYMBOL INPUT AND SOFT DECISION DECODING

SY5, XT25, A85



MAX POWER: -14.20 dBW
TOT POWER: 0.00 dBW

FSCSS RUN IDENTIFIER : S05C0005

Figure 4-13. Soft Decision Test 8FSK Spectrum

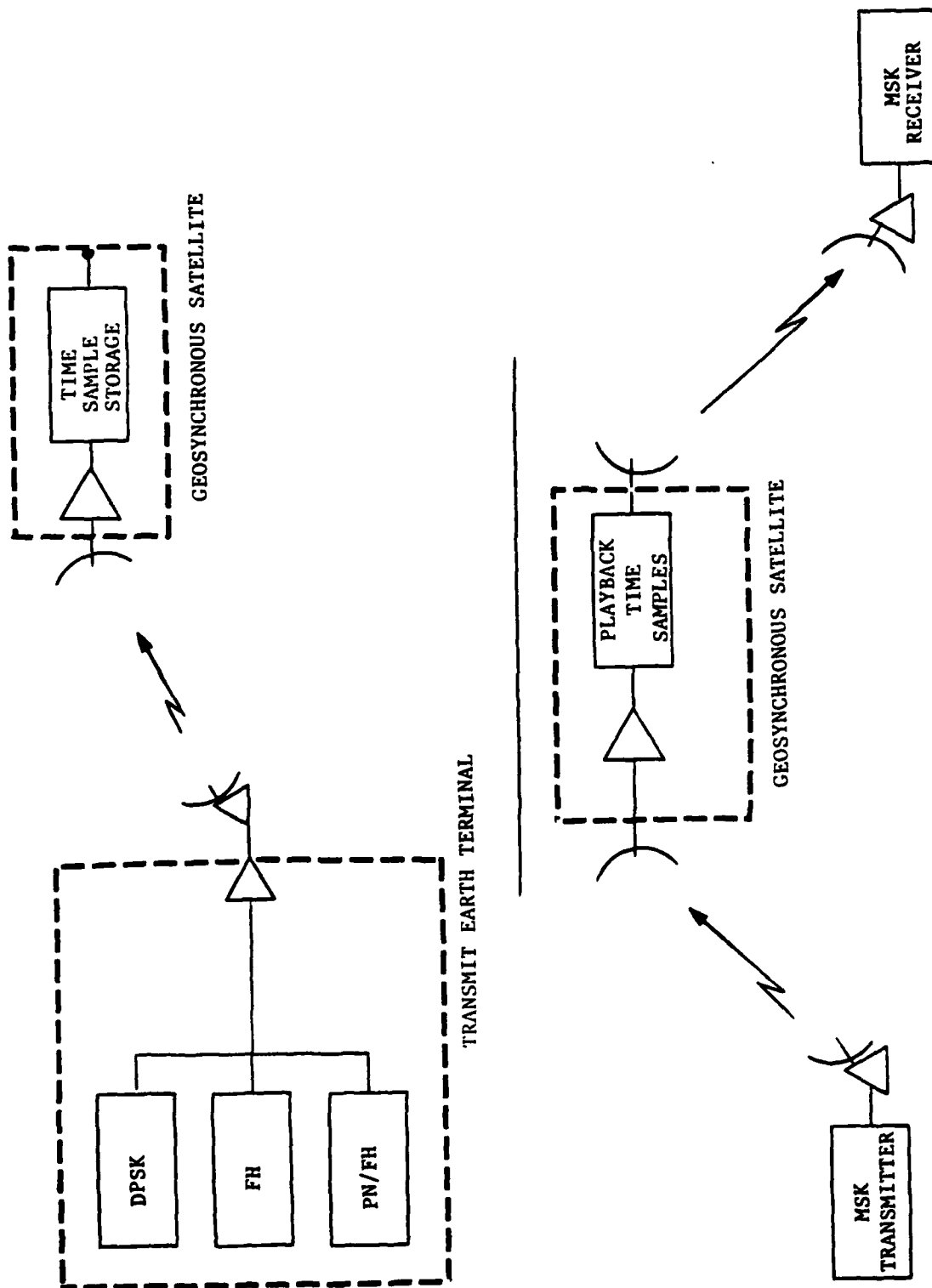
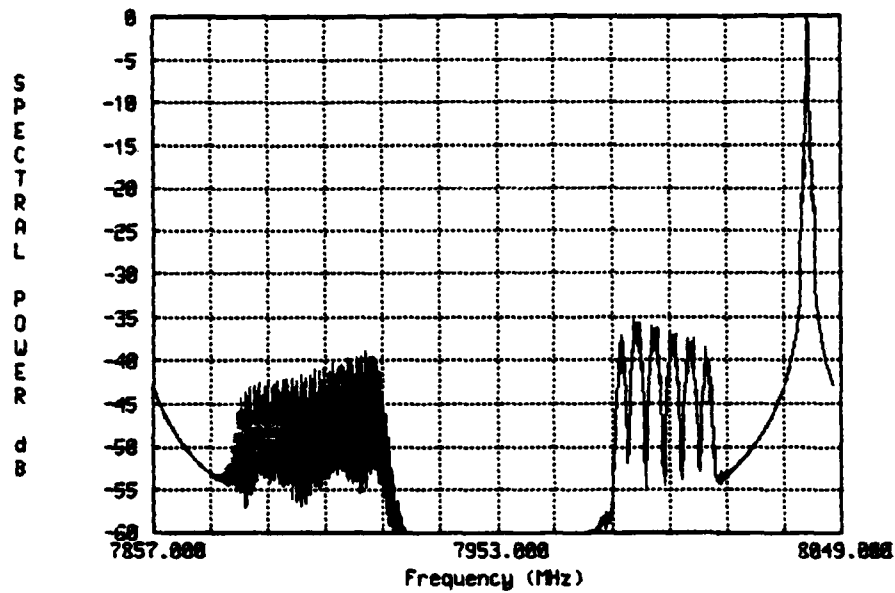


Figure 4-14. MSK Soft Decision Decoding Configuration

FFT - ZF1 -- SET UP KEEP SAMPLES FOR TEST NO. 8

SY12, SA90, 18C2



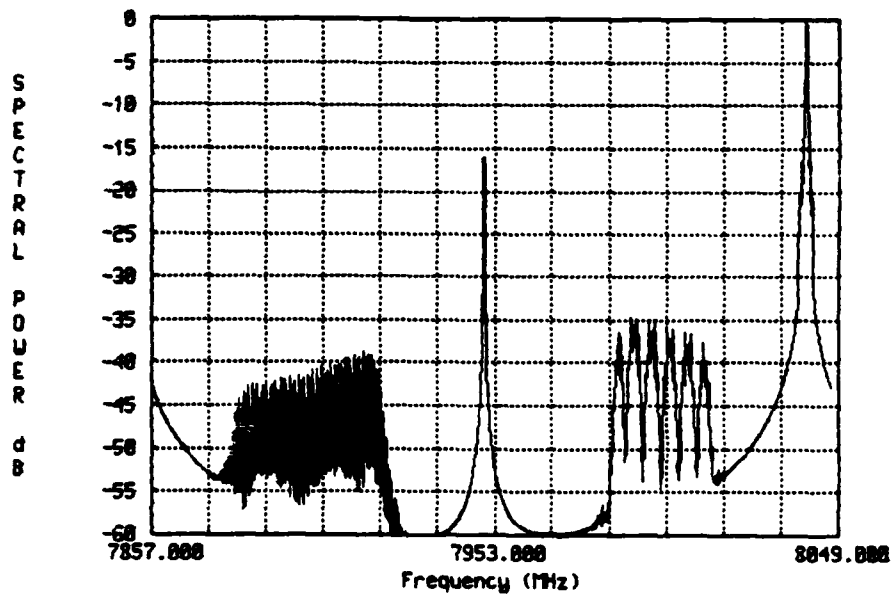
MAX POWER: -17.66 dBu
TOT POWER: -9.96 dBu

FSCSS RUN IDENTIFIER : S12R0003

Figure 4-15. Stored Spectrum

FFT - ZF1 -- TEST SAVE SAMPLES ON SOFT DECISION.

SY30, RV100, 1A03



MAX POWER: -19.43 dBu
TOT POWER: -11.46 dBu

FSCSS RUN IDENTIFIER : S30J0007

Figure 4-16. Composite Spectrum

in the spectrum to be stored by making the transmit filters have a very sharp cutoff. Due to the absence of thermal noise or adjacent channel interference in this notch, the demodulated MSK signal had a 0 BER, as expected.

4.8 OSCILLATOR PHASE NOISE (TEST 9)

The purpose of this test is to verify the operation of the FSCSS oscillator phase noise model. This model has been revised to allow for a more realistic number of points (50) to specify the spectral characteristics of the oscillator phase noise. A capability has also been added that allows the user to specify coefficients of the phase characteristic and to have FSCSS calculate the 50 sample points.

Phase and thermal noise degradations are measured indirectly by using the demodulator statistics measurements in FSCSS. The effect of the thermal noise which passes through the loop filter and subsequently perturbs the local oscillator is measured at the output of the local oscillator. It is given by the variance of oscillator phase. The degradation due to the oscillator phase noise which is not cancelled out by the loop filter is measured at the phase lock loop (PLL) and is given by the variance of PLL error. A PLL model showing the measurement points is given in Figure 4-17.

The procedure followed was to measure each degradation separately in the absence of the other and then compare the results with those given in Reference 12. The results of these tests are shown on page A-10. There was very good agreement in the thermal noise portion of the runs--within 0.4 dB of the value given in Reference 12. The phase portion of the results, however, was about 4 dB low according to the reference. A study was undertaken to determine the cause of the discrepancy. The PLL bandwidth was varied ± 2 Hz from the optimum of 10.89 Hz and the thermal and phase noise tests repeated. The results of this

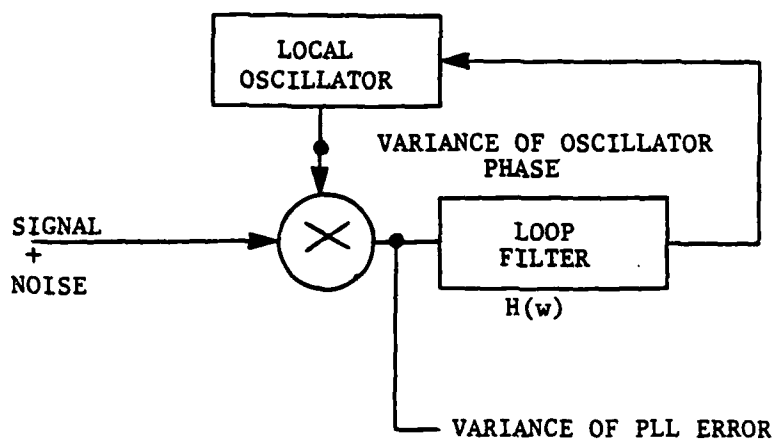


Figure 4-17. PLL Model and Measurement Points

investigation are given in Table 4-2. A set of calculations of the expected thermal and phase noise variance for an ideal ("square" transfer function) loop filter were made and are also given in Table 4-2. Both calculated and measured results are given graphically in Figure 4-18.

As can be seen, the thermal noise measurements are consistently about 0.8 dB above the calculated values. This is due to the fact that the loop filter is not ideal. The noise equivalent bandwidth seems to be about 1.1 times the nominal bandwidth which is consistent with Figure 3-2 of Reference 12. Thus, the thermal noise portion of the results tends to confirm the results of Phase II Acceptance Tests (Reference 6) - the FSCSS phase lock loop implementation is working correctly.

The phase noise results of Figure 4-18 tell a lot about the nature of the problem. Firstly, the slope of the calculated and measured curves are the same, indicating that the spectral shape of the phase noise is correct. Since the spectrum of the phase increases sharply with falling frequency, one expects considerably more power through the real PLL filter than through an ideal square filter. From the filter shape given in 3-2 of Reference 12, one would expect roughly 6 dB more power through the real filter than through a square filter. The measurement indicates only 3 dB more. The results of this acceptance test and of these further exploratory tests are therefore consistent. The FSCSS phase noise process is correct except for a -3 dB constant multiplier.

An examination of the FSCSS FREQTR module, which implements the phase noise generation, revealed that an error was introduced in the code during the process of removing extraneous diagnostic code used to find outstanding problems from Phase II. The input noise process had been made real rather than complex by setting the imaginary part to zero. This, of course, results in the 3 dB reduction in power.

Table 4-2. Phase Noise Results

1. MEASUREMENTS

LOOP BANDWIDTH (Hz)	VARIANCE OF OSCILLATOR PHASE (THERMAL NOISE) (dB)	VARIANCE OF PLL ERROR (PHASE NOISE) (dB)
8.89	-15.66	-19.56
10.89	-14.60	-21.17
12.89	-13.98	-22.43

2. CALCULATED RESULTS (Assuming ideal square cutoff in PLL filter)

LOOP BANDWIDTH (Hz)	THERMAL NOISE POWER (dB)	PHASE NOISE POWER (dB)
8.89	-16.60	-23.0
10.89	-15.70	-24.8
12.89	-15.00	-26.1

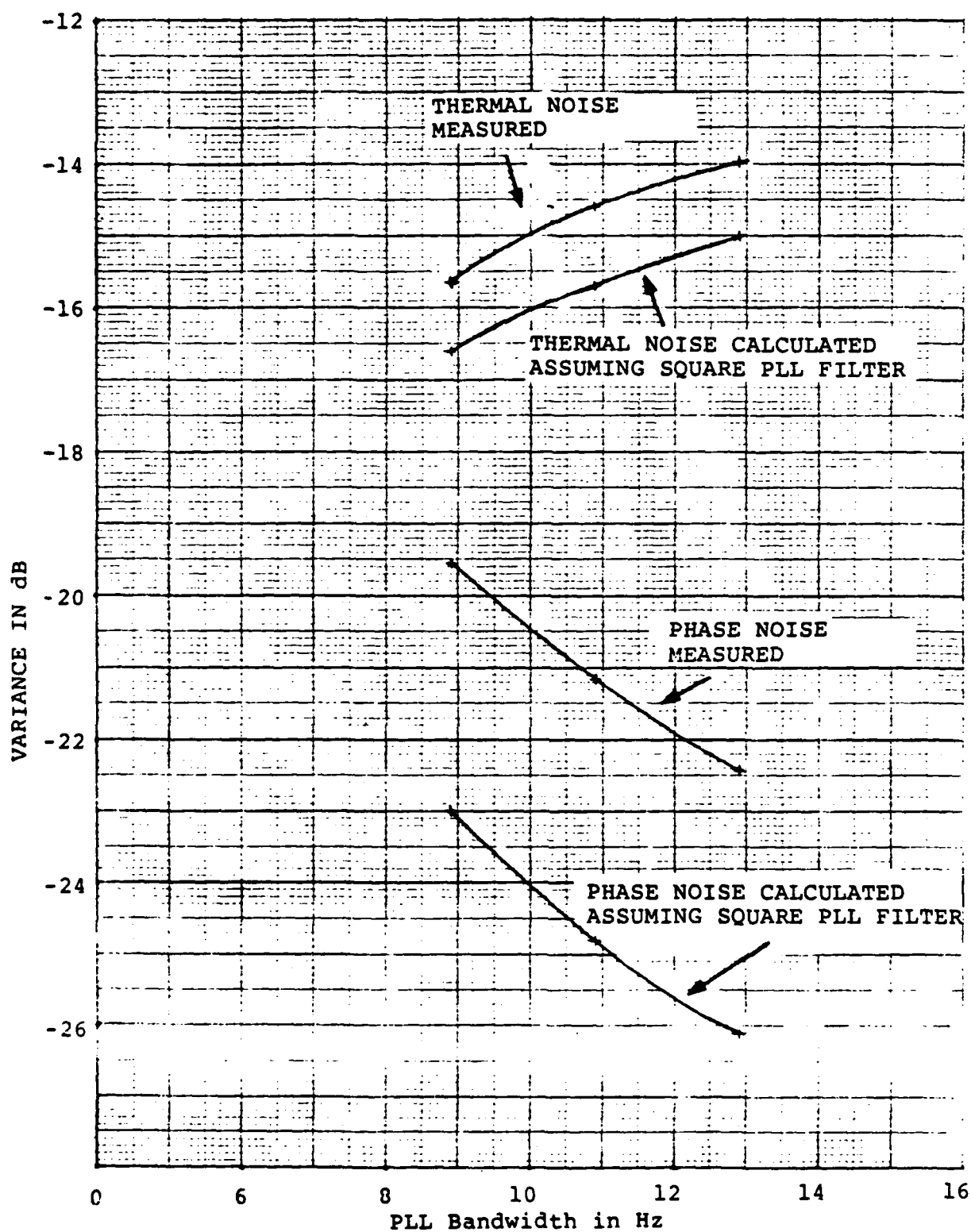


Figure 4-18. Phase Noise Test Results

This error was corrected and the expected 3 dB increase in phase noise was measured. The correct result of this test is then -18.1 dB (re 1 rad²/Hz) measured versus -17.1 dB predicted by Reference 12. This seems to be an excellent agreement in light of the 2 Hz phase noise spectral line spacing used in the test.

4.9 REMODULATION (TEST 10)

The purpose of this test is to demonstrate the FSCSS capability to demodulate and subsequently remodulate a signal onboard a satellite. In this test a noiseless, linear channel was assumed since the essential point to be demonstrated is the correct passing of bits from the demodulator to the modulator for remodulation.

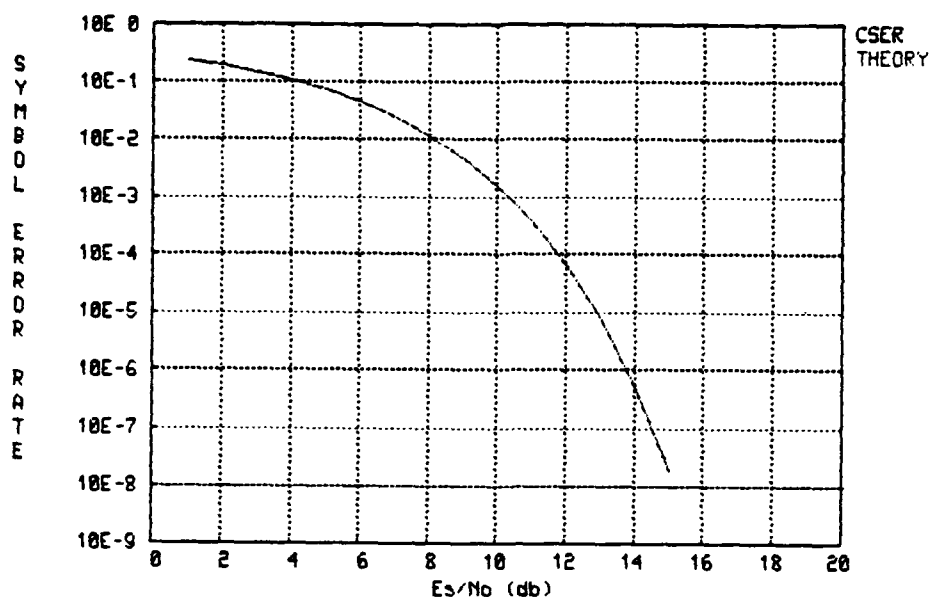
A QPSK signal was used on the uplink and a differentially encoded OQPSK was used on the downlink. The only losses were due to free space. As expected, neither link had any bit errors. The accompanying CSER plots (Figures 4-19 and 4-20), as well as a detailed analysis of the demodulator reports, indicate that FSCSS is handling remodulation correctly. The results of these tests are shown on page A-11.

4.10 ATMOSPHERIC EFFECTS (TEST 11)

These tests are intended to demonstrate that the modifications to the atmospheric effects device operate correctly on uplink and downlink paths. FSCSS was operated in the interactive mode with debugging data switches turned on so that the atmospheric effects calculations performed during the presimulation phase could be observed and captured on the Tektronix hard copy terminal, shown in Figure 4-21. Atmospheric absorption, cloud attenuation, and rain attenuation values obtained from Figure 4-21 were compared to hand calculations shown in the test results on pages A-12 and A-13.

REMDD ACCEPTANCE TEST,QPSK TO DQPSK, 1Mbps, DIFF

SY89, SA93, 1AB3

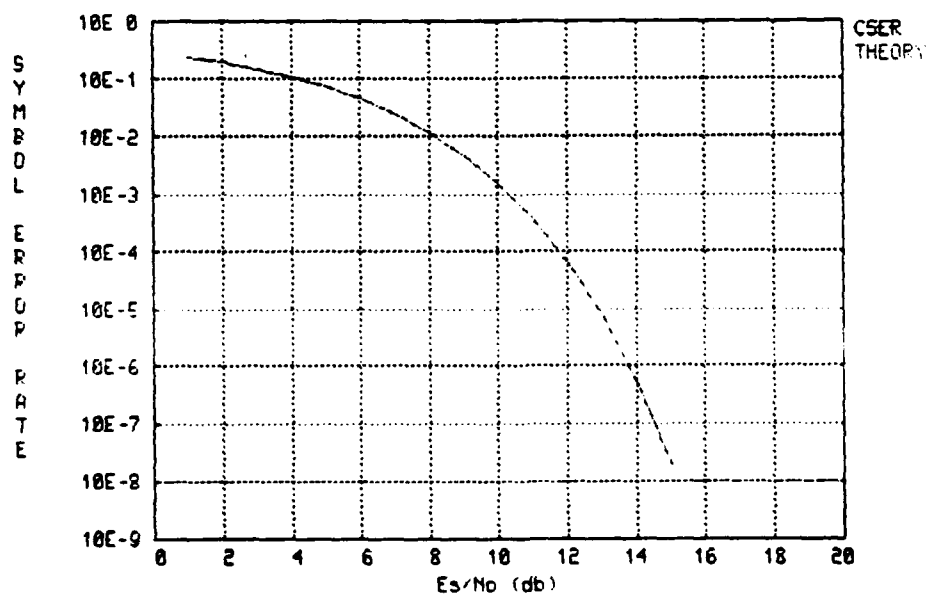


FSCSS RUN IDENTIFIER : S89A0002

Figure 4-19. CSER Measurement: Satellite Demodulator

REMDD ACCEPTANCE TEST,QPSK TO DQPSK, 1Mbps, DIFF

SY89, RU94, 1AB4



FSCSS RUN IDENTIFIER : S89A0002

Figure 4-20. CSER Measurement: Receive Earth Terminal Demodulator

```

      $$$ Enter TRLOSS
Reading in Transmitting Element record number:      236
Reading in Receiving Element record number:      152
$$$ ENTERING FREESP...
  AZIMUTH ANGLE FROM TRANS-->RECEIVER: 4.35703E+00
  AZIMUTH ANGLE FROM REC-->TRANS : 8.01187E-01
  ELRCXM = -1.42381E+00
  ELXNRC = 2.46081E-01
  DFTRAN = 1.46081E-01
  FRSPLS = 5.93436E-11
$$$LEAVING FREESP...
Just back from FREESP
  AZXNRC = 4.35703E+00
  ELXNRC = 2.46081E-01
  ELRCXM = -1.42381E+00

  Inside scan loop, PLPTRMP =      12
  DIRECTN = -1
  AZPATH = 4.35703E+00
  ELPATH = 2.46081E-01
  ANTLNG = 2.09440E+00
  .... Enter BOUNDCHECK
  PLPTRMP =      11
  PLDEUNAM = AN
  PLDEUNAM = AN
  ANINDEX =      1
  Inside scan loop, PLPTRMP =      12
  AZPATH = 8.01187E-01 ELPATH = -1.42381E+00
  .... Enter BOUNDCHECK
  PLPTRMP =      13
  PLDEUNAM = UE
  PLDEUNAM = UE
$$$ BEGIN PROCEDURE PROP
ATMOS ABSORPTION FLAG=YE
FCENT= 1.000000000000E+10 X= 4 TOTZNAT = 2.70000E-02
ATMOS ASSORP= 1.10835E-01 AEATTEN= 9.87321E-01
CLOUD ATTENUATION FLAG=YE
CLOUD ATTN (ATCLD) = 2.39079E+01 AEATTEN = 6.29596E-02
RAIN ATTENUATION FLAG=YE
AEDIVER FLAG= NO TINSIG= 9.99900E-01
RAIN RATE (RAINRT) = 3.70000E+01
RAIN ATTENUATION (ATRAIN)= 3.67677E+01 AEATTEN= 9.13433E-04
CROSS POLARIZATION FLAG=YE
CROSS POLARIZATION (AXPOL)= 1.46020E+00 AEATTEN= 7.72089E-04
--- END OF PROP WITH STATUS =      1
  .... Enter BOUNDCHECK
  PLPTRMP =      14
  PLDEUNAM = AN
  PLDEUNAM = AN
  ANINDEX =      1
$$$ Leave TRLOSS
      $$$ Enter TRLOSS
Reading in Transmitting Element record number:      152
Reading in Receiving Element record number:      150
$$$ ENTERING FREESP...
  AZIMUTH ANGLE FROM TRANS-->RECEIVER: 7.86012E-01

```

Figure 4-21. Atmospheric Effects Debug Data

Several minor problems were discovered during the test; namely:

1. Atmospheric absorption - interpolation for water vapor densities between 0 and 7.5 gm/m^3 is not done correctly.
2. Downlink paths - the satellite's elevation angle is used for the calculations instead of the receive earth terminal's.
3. Cross-polarization - the rain model attenuation calculation includes the effects of signal depolarization, but the cross-polarization loss is being added separately.

These problems will be corrected during the maintenance phase of the contract.

4.11 NUCLEAR EFFECTS (TEST 12)

This set of tests is intended to verify that the FSCSS nuclear effects enhancement to the propagation anomalies device is working correctly.

The Channel Impulse Response Function (CIRF) (Reference 8), which is the heart of the nuclear effects device, has been tested off-line and verified to be working properly (Figure 4-22). This program was then integrated into the FSCSS environment for testing. The CIRF function has been implemented essentially directly from Reference 8. The original program generates 2048 samples, which, given the signal decorrelation time (τ_0), determines the time interval spanned by the sequence. For FSCSS runs longer than that time span, multiple calls to the CIRF routine are required. A modification was made to the CIRF routine to provide a smooth transition between 2048-sample sequences.

Two separate tests were run to demonstrate operation of the CIRF routine: a CW carrier test and a BPSK test. The results of these tests can be found on pages A-14 and A-15. In both cases, values were chosen for the nuclear effects device which seemed

FSCSS NUCLEAR SCINTILLATION - DELAY 1/2
 TAU9 - 001 F0 - 1000 DT - 0.4 E-5 DO - 4 E-4 SEED - 123

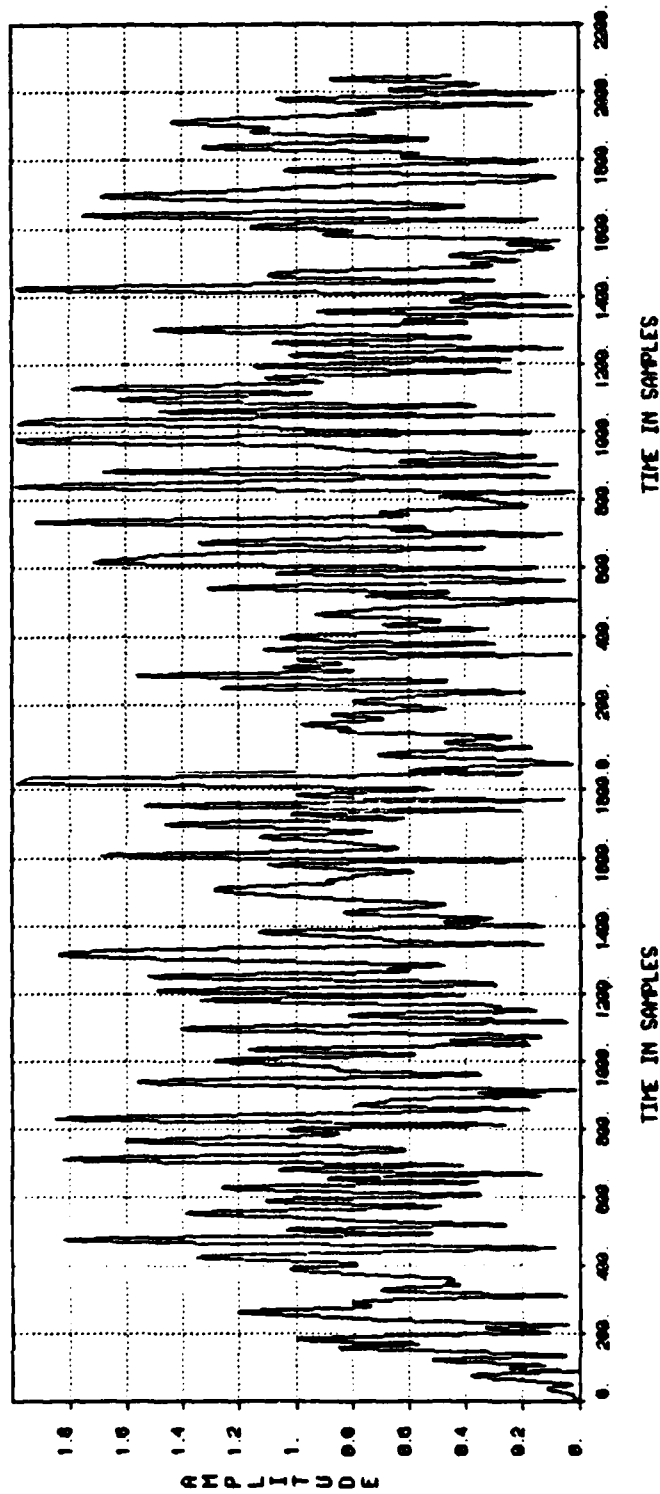


Figure 4-22. CIRF Amplitude Fading Plot

reasonable but which do not correspond to any particular scenario: low absorption, small decorrelation times, and large frequency selective bandwidths.

The results for the CW case are shown in Figures 4-23 and 4-24. Note that the signals have been "smeared", indicating that phase perturbations exist on the channel giving the appearance of a phase modulated waveform.

In the BPSK case we note that the inphase I&D voltage (Figure 4-25) now has a slowly (relative to the data rate) changing envelope. The quadrature I&D voltage (Figure 4-26), which we normally expect to be 0, also has a changing envelope, again indicating that there is a phase perturbation on the channel. Likewise, the carrier phase (Figure 4-27) is changing quite dramatically with time. Upon examining the detailed BER report on our listing, we find that the PLL is able to track the signal for some 193 bits, then loses lock and is unable to regain carrier lock on the signal.

The above results lead us to believe that the nuclear effects device is working correctly. Further tests will be conducted during the maintenance phase to obtain quantitative results.

4.12 MSK MODULATORS AND DEMODULATORS (TESTS 7 & 8 OF PHASE II)

The purpose of this set of tests is to verify the operation of the MSK modem in the presence of thermal noise. A test configuration was used which has a wide bandwidth and a completely linear channel. The demodulator was "locked" during the presimulation phase using a noiseless preamble.

The results of this test are given on page A-16. Table 4-3 summarizes the results obtained. The BER to be obtained was based upon results given in Reference 16. Very close agreement with the theoretical results was obtained.

FFT - ZF1 -- TEST NUKES WITH CLPS.

SY23, XT191, 1BC1

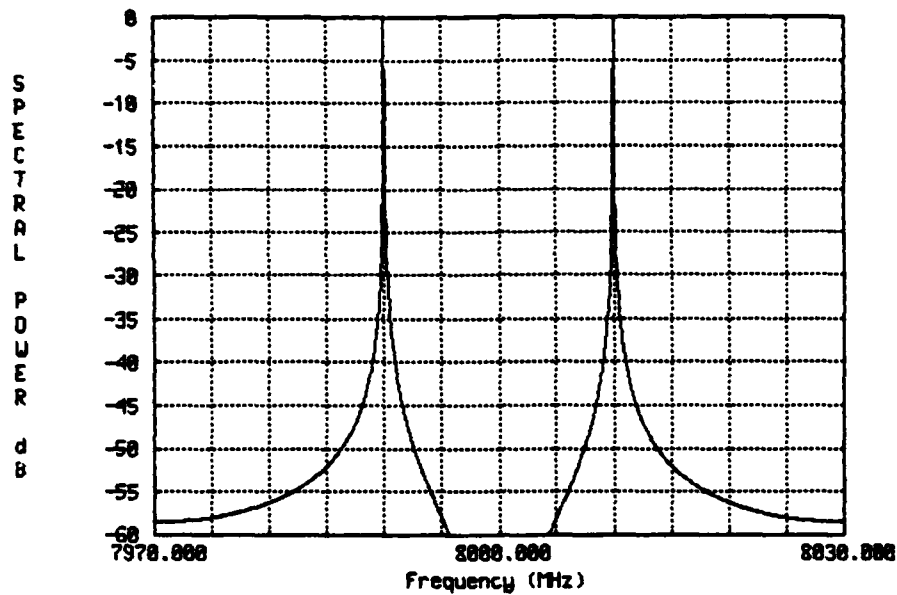


Figure 4-23. C. W. Test Spectrum before Nuclear Scintillation

FFT - ZF1 -- TEST NUKES WITH CLPS.

SY23, SA190, 1A02

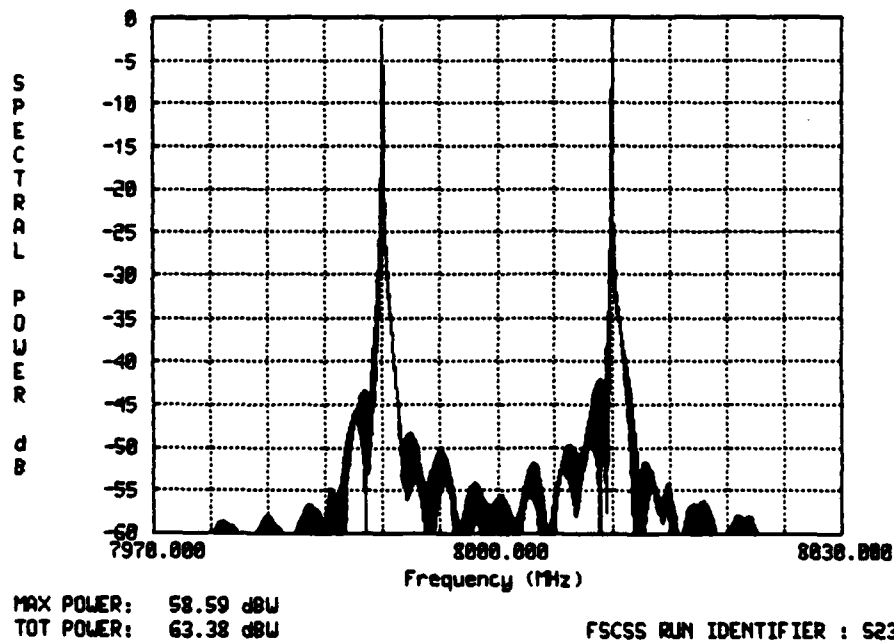
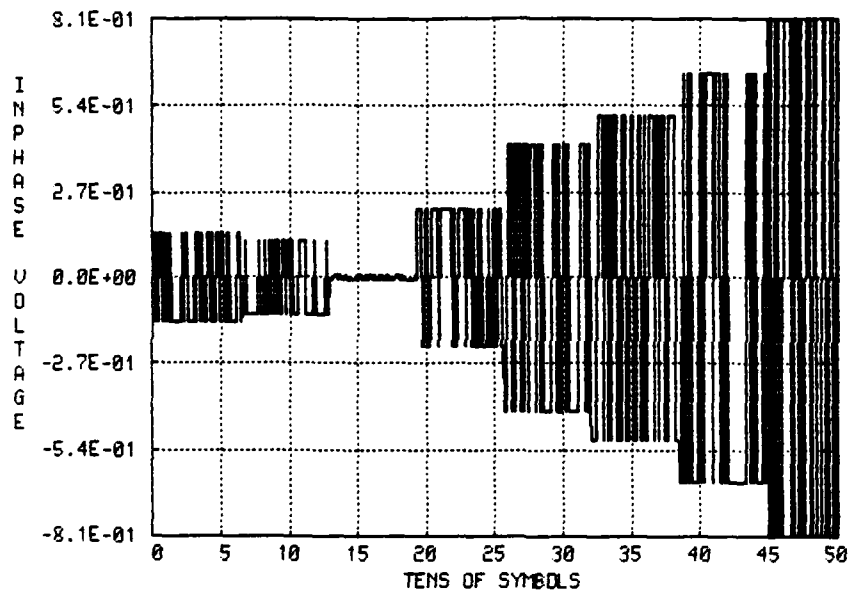


Figure 4-24. C. W. Test Spectrum after Nuclear Scintillation

DEM0D - DA108 -- TEST OF NUKE EFFECTS. BPSK

SY44, SA174, 18C3

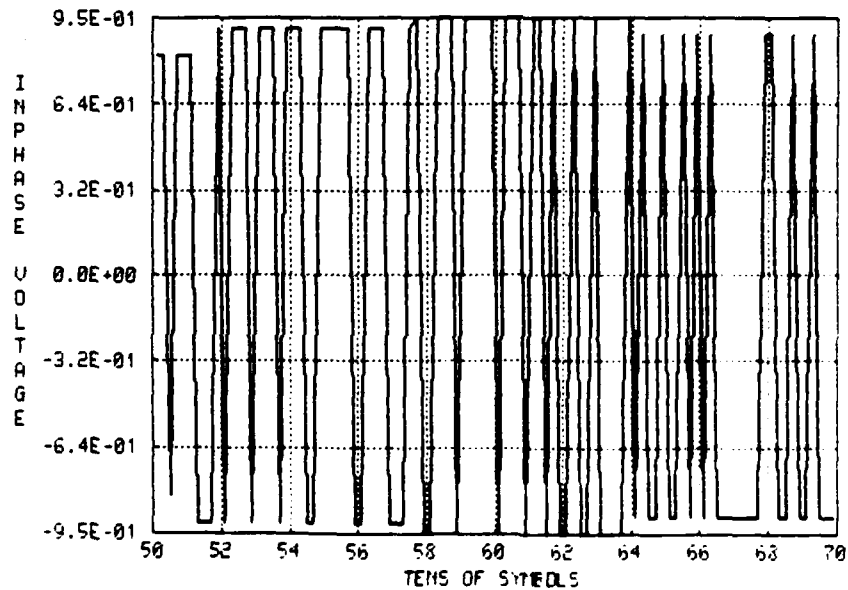


FSCSS RUN IDENTIFIER : 544B0006

Figure 4-25(a). BPSK I&D Inphase Voltage

DEM0D - DA108 -- TEST OF NUKE EFFECTS. BPSK

SY44, SA174, 18C3

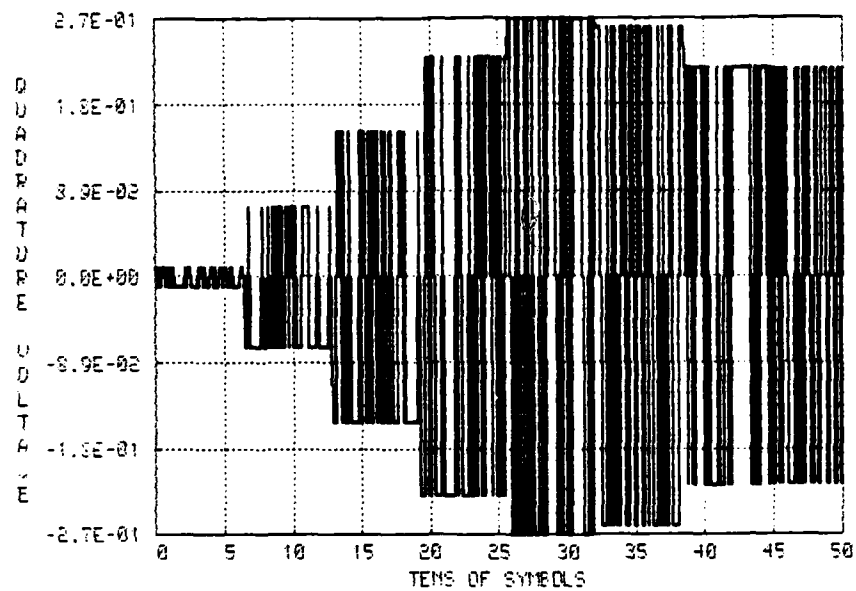


FSCSS RUN IDENTIFIER : 544B0006

Figure 4-25(b). BPSK I&D Inphase Voltage

DEM00 - DA10S -- TEST OF NUKE EFFECTS. BPSK

SY44, SA174, 1B03

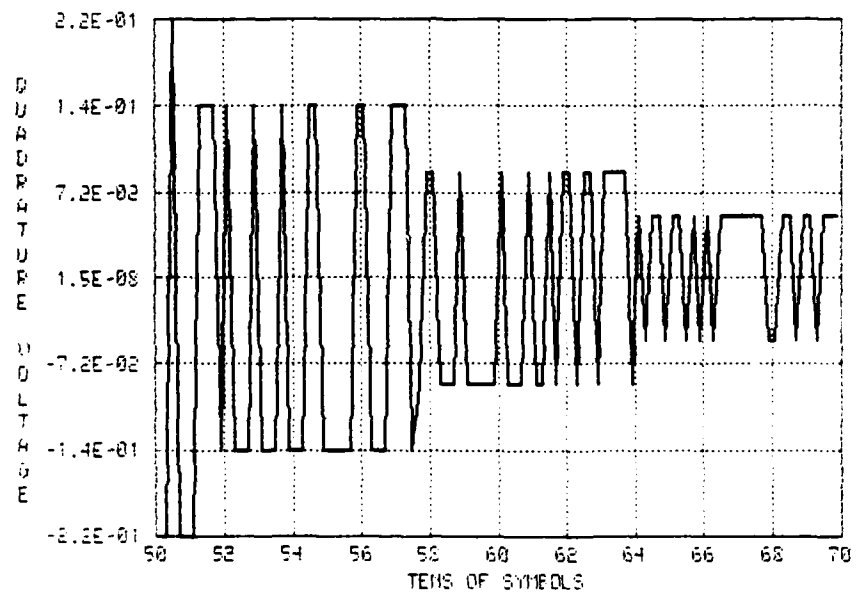


FSCSS RUN IDENTIFIER : 544E000E

Figure 4-26(a). BPSK I&D Quadrature Voltage

DEM00 - DA10S -- TEST OF NUKE EFFECTS. BPSK

SY44, SA174, 1B03

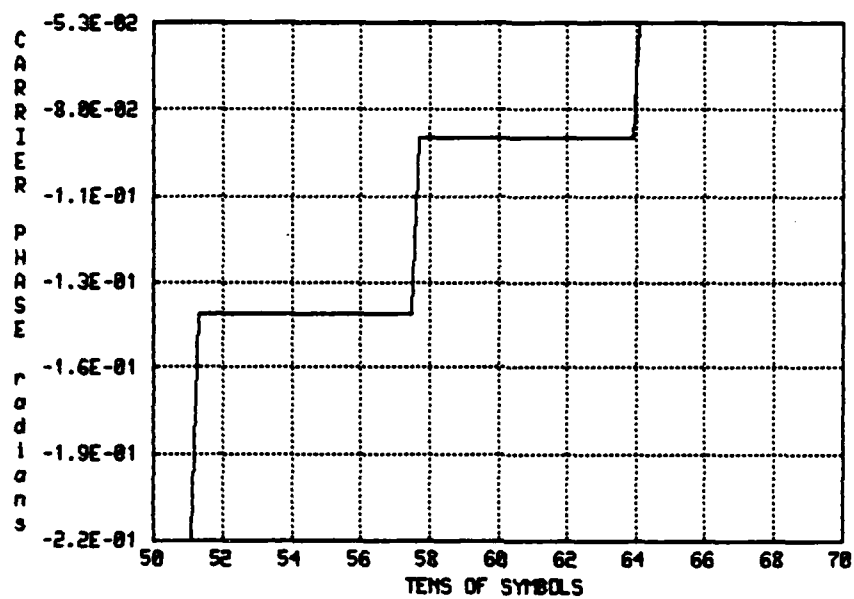


FSCSS RUN IDENTIFIER : 544E000E

Figure 4-26(b). BPSK I&D Quadrature Voltage

DEM00 - DA108 -- TEST OF NUKE EFFECTS. BPSK

SY44, SA174, 18C3



FSCSS RUN IDENTIFIER : S4480006

Figure 4-27. BPSK Carrier Phase Plot

Table 4-3. MSK Thermal Noise Results

TEST	E_b/N_o (dB)	EXPECTED BER	MEASURED BER	ACCURACY (%)	NUMBER OF BITS
7	3	3.2×10^{-2}	3.22×10^{-2}	+ .63	11,876
8	5	1.0×10^{-2}	1.00×10^{-2}	± 0	34,814

SECTION 5 - CONCLUSIONS

The enhancements added to FSCSS during Phase III represented a large effort over a compressed period of time. The result was that all the enhancements could not be tested to our total satisfaction before the formal acceptance test phase. All devices passed acceptance tests successfully except for the block and synchronous interleavers in configurations with other encoders, and minor errors in the atmospheric effects phase noise calculations. These problems will all be corrected during the FSCSS maintenance phase.

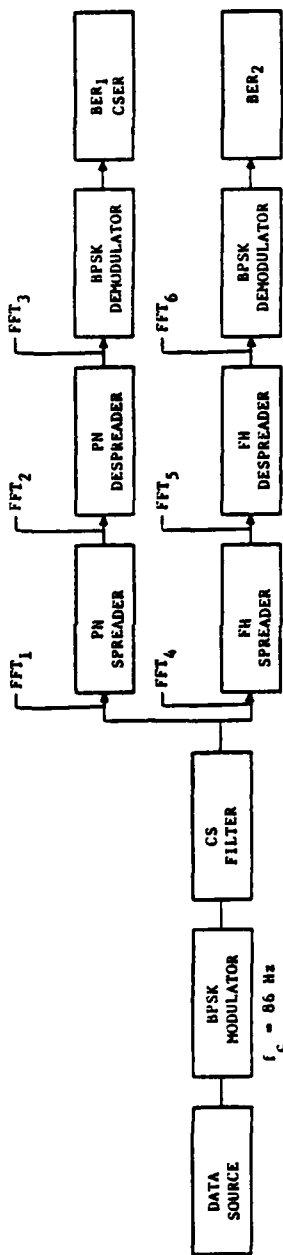
Version 3.0 of FSCSS has met the goals established during Phase III of the contract. Improved user-friendliness has been achieved, a color graphics system has been integrated, simulation speed has been improved, additional devices and capabilities have been added, and unresolved problems left over from Phase II have been solved. Updated versions of both the User's and Software Maintenance Manuals have been delivered. Table 5-1 summarizes the features modeled by FSCSS Version 3.0.

Table 5-1. SATCOM Features Modeled by FSCSS

Data Sources	Random, External Sequence
Encoders/Decoders	Differential Convolutional (Viterbi algorithm decoding), Block and Synchronous Interleavers/Deinterleavers, Bit-to-Symbol and Symbol-to-Bit Converters
Modulators/Demodulators	BPSK, QPSK, OQPSK, 8PSK, 16PSK, DPSK, APSK, FSK, MSK, CPFSK, PN, FH(FSK), FH(PN)
Jammers/Interferers	CW, SWEPT, PULSE, Demand Access with Modulators Above
Filters	Chebyshev, Butterworth, Thompson, Transitional Butterworth/Thompson, Bessel, Legendre, Poles and Residues, Frequency Sample (30 Amplitude and Phase Points), Poles and Zeros
Limiters	Hard, Soft (30 Amplitude and Phase Points)
Frequency Translators	Up, Down, Phase Noise (50 Frequency Samples on One Side of the Carrier)
Antennas	Earth Coverage, Narrowbeam, MBA (Bessel Singlets), MBA (Stored Singlets), Phased Array, Gain, Adaptive (MBA, Phased Array)
Propagation	Free Space Loss, Atmospheric Effects, Doppler, Scintillation, Cross-Polarization, Arbitrary Fluctuations, Transmission Loss, Nuclear Effects
Noise Sources	Thermal Noise, Time Samples Stored from Previous Run
Measurements	Power, Fast Fourier Transform, Bit Error Rate, Demodulator Related Statistics all with Time Window Capabilities
Multiple Access Techniques	FDMA, SSMA, TDMA, SSTDMA, PNTDMA
Spreaders	FH, PN
Despreaders/Correlators	FH, PN, PN/FH
Standard Device Groups	Stored Combinations of the Above to Form Specific Modems, Earth Terminals and Satellites.

APPENDIX A - ACCEPTANCE TEST DATA SHEETS

ACCEPTANCE TEST 2: PN and FH SPREADERS



RUN	Pb ₁	Pb ₂	BER ₁	BER ₂	P ₁ (dB)	P ₂ (dB)	P ₃ (dB)	P ₄ (dB)	P ₅ (dB)	P ₆ (dB)	NOTES
1	0	0	0	0	-0.55	-0.55	-	-0.55	-0.55	-	147 bits

DEVICE PARAMETERS:

DATA SOURCES: 1 Mbps

PN SPREADER: 40 MHz = R_c

86 Hz = f_c

16Q Registers = 31 bits long

I Seed = 14656

Q Seed = 14854

FH SPREADER AND DESPREADER: 86 Hz = f_c

4 MHz = Spacing

23 = 8 cells

.1 MHz Hop Rate

Generator = 10 bits

Seed = 12345

PN DESPREADER: 40 MHz = R_c

8 GHz = f_c

16Q Registers = 31 bits long

I Seed = 14656

Q Seed = 14854

TLL Bandwidth = .1 Hz .707 = z

Filter = 10 MHz Wide

CS FILTER: 3 dB Bandwidth = 2 MHz

11 Poles

Ripple = .01 dB

BPSK DEMODULATOR: TLL Bandwidth = .1 Hz .707 = z

PLL Bandwidth = 1 Hz .707 = z

Hard Decision

16D Detector

Min. Sig. = 0 dB

No Limiter

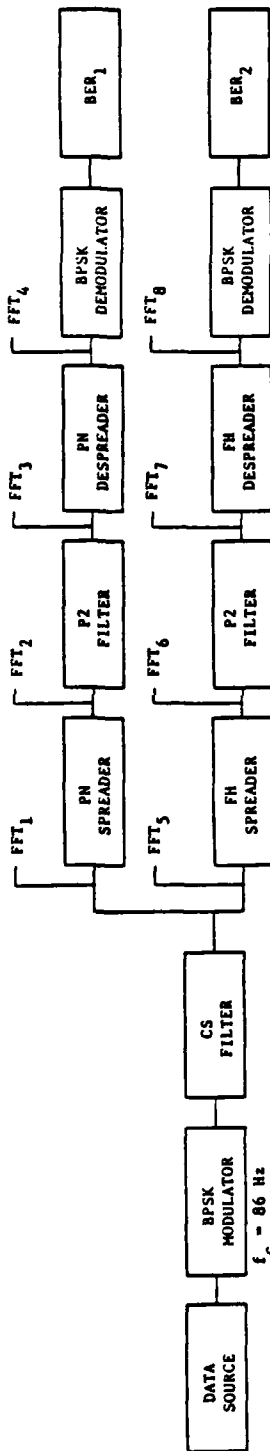
Performed by:

Witnessed by:

Date:

James D. Gifford
W. E. Beckert
1 April 1985

ACCEPTANCE TEST 3: PN and FH SPREADER with POLES and ZEROS FILTER



RUN	P ₀	P ₁	P ₂	P ₃	P ₄	P ₅	P ₆	P ₇	P ₈	P ₉ /P ₇	NOTES
1	0	0	0	0	-0.61	-1.2	-0.61	-1.2	-0.61	0	104.15

DEVICE PARAMETERS:

DATA SOURCE: 1 Mbps

CS FILTER: 3 dB Bandwidth = 2 MHz

11 Poles

Ripple = 0.01 dB

PN SPREADER: 40 MHz = R_C

8 GHz = f_C

16Q Registers = 31 bits

I Seed = 14656

Q Seed = 14854

FH SPREADER/DESPREADER: 8 GHz = f_C

4 MHz Spacing

8 Cells

1 MHz Hop Rate

Generator = 10 bits

Seed = 12345

PN DESPREADER: 40 MHz = R_C

8 GHz = f_C

16Q Registers = 31 bits

I Seed = 14656

Q Seed = 14854

TLL Bandwidth = .1 Hz .707 = z

10 MHz Wide Filter

BPSK DEMODULATOR: 8 GHz = f_C

TLL Bandwidth = .1 Hz .707 = z

PLL Bandwidth = 1 Hz .707 = z

Hard Decision

16Q Detection

Min. Sig. = 0 dB

No Limiter

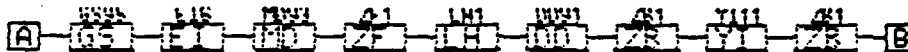
P2 Filter (Attached)

Performed by: *[Signature]*

Witnessed by: *[Signature]*

ACCEPTANCE TEST 4: SYNCHRONOUS INTERLEAVER WITH 8-FSK

Test Configuration: SY12, XT36



Data Rate: 2.4 Kbps

Interleaver Size: 13 x 29

Modulator Frequency: 150 MHz

Frequency Spacing: 50.1 KHz

RESULTS

Expected BER

0

Measured BER

C

No. of Bits

498

Performed by:

D. J. Oswald

Witnessed by:

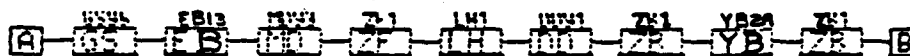
J. E. Bechert

Date:

April 4, 1985

ACCEPTANCE TEST 5: BLOCK INTERLEAVER WITH 8-FSK, 2 REPETITIONS

Test Configuration: SY27, XT157



Data Rate: 2.4 Kbps

Interleaver Size: 8 x 32

Modulator Frequency: 70 MHz

Frequency Spacing: 35 KHz

RESULTS

Expected BER

0

Measured BER

0

No. of Bits

1017

Performed by:

W. L. Arnold

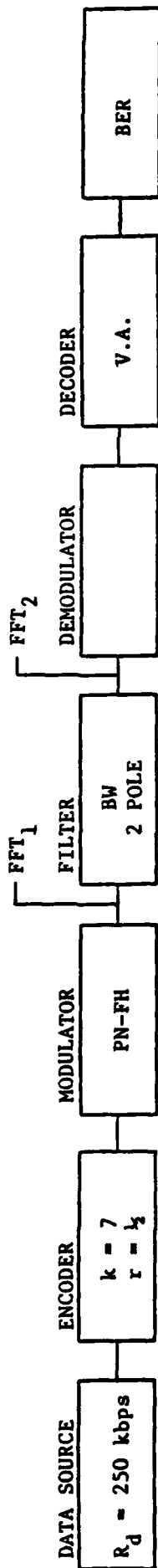
Witnessed by:

J. E. Burkert

Date:

April 4, 1985

ACCEPTANCE TEST 7A: SOFT DECISION DECODING OF PN-FH



DEVICE PARAMETERS:

MODULATOR/DEMODULATOR

PN-FH

$f_c = 86 \text{ Hz}$

Chip Rate = 5 MHz

Hopover $2^2 = 4$ cells
= 5 MHz

I Register = 31 Bits Seed = 101010

Q Register = 31 Bits Seed = 101010

Hopping Register = 10 bits Seed =

TLL = 0 Hz $z = .707$

PLL = 0 Hz $z = .707$

Soft Decision

Min. Sig. Level = -10 dB

No AGC

FILTER

2 Pole Butterworth

3 dB = 25 MHz

ENCODER/DECODER

$k = 7$

$r = 1/2$

3 Bit Quantization

Memory Length = 40

$\sigma^2 = .5$

Quantizer Metrics:

RESULTS:

EXPECTED BER	MEASURED BER	P_1 (dB)	P_2 (dB)	P_1/P_2 (dB)	N. BITS
0	0	0	-3.3	+0.1	47

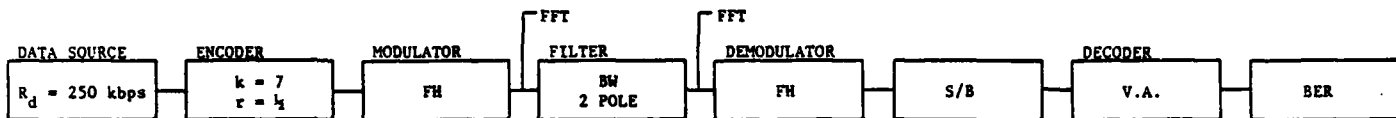
Performed by:

Witnessed by:

Date:

James W. Smith
J. W. Smith
April 4, 1985

ACCEPTANCE TEST 7B: SOFT DECISION DECODING OF FREQUENCY HOPPER



DEVICE PARAMETERS:

MODULATOR/DEMODULATOR

$f_c = 7900$ MHz
 Hopover $2^2 = 4$ cells
 cell = 1 MHz wide
 2 FSK
 $\Delta f = 500$ kHz
 Hopping Register = 20 bits
 Seed = 10101
 TLL = 0 Hz $z = .707$
 Soft Decision
 Symbol Output

FILTER

Butterworth
 Pole
 $f_c = 7900$ MHz
 3 dB =

CODER/DECODER

$k = 7$
 $r = 1/2$
 40 bit Memory
 3 bit Soft Decision
 $\sigma^2 = 0.5$
 Quantizer Metrics

RESULTS:

EXPECTED BER	MEASURED BER	P_1 (dB)	P_2 (dB)	P_1/P_2 (dB)
0	0	0	- .03	.03

Performed by: *[Signature]*
 Witnessed by: *[Signature]*
 Date: *June 4 1985*

ACCEPTANCE TEST 7C: DPSK SOFT DECISION DECODING

DEVICE PARAMETERS:

MODULATOR/DEMODULATOR

$f_c = 8040$ MHz
 TLL = 0 Hz $z = .707$
 No AGC
 Min. Signal Level =
 Soft Decision

FILTER

11 Pole CS
 -1 dB Ripple
 3 dB = 4 MHz

ENCODER/DECODER

$k = 7$
 $r = 4$
 Memory = 40 bits
 3 bit Soft Quantization
 $\sigma^2 = .5$
 Quantizer Metrics

RESULTS:

<u>EXPECTED BER</u>	<u>MEASURED BER</u>	<u>P_1 (dB)</u>	<u>P_2 (dB)</u>	<u>P_1/P_2 (dB)</u>
0	0	0	0.16	10.10

Performed by: James J. Sauter
 Witnessed by: J. E. Buckner
 Date: April 2, 1985

ACCEPTANCE TEST 7D: SOFT DECISION DECODING OF 8-FSK WITH SYMBOL INPUT
TO THE MODULATOR

Test Configuration: SY5, XT25

A ^{GEPE}GS ^{EC61}EC ^{ES57}ES ^{ED143}ED ^{ZE1}ZE ^{LH1}LH ^{DD14}DD ^{YS21}YS ^{YU}YU ^{ZB1}ZB B

Data Rate: 2.4 Kbps

Modulator Frequency: 70 MHz

Frequency Spacing: 35 KHz

Viterbi Decoder: Rate $\frac{1}{2}$, Constraint Length 7, 3-Bit Quantization

RESULTS

Expected BER

0

Measured BER

0

No. of Bits

396

Performed by:

D. F. Arnaud

Witnessed by:

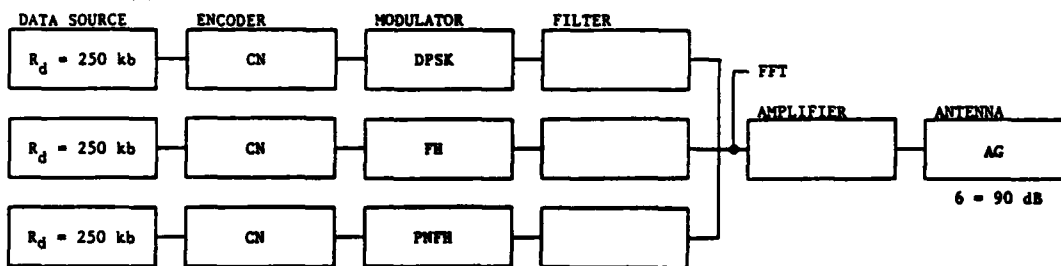
J. E. Becker

Date:

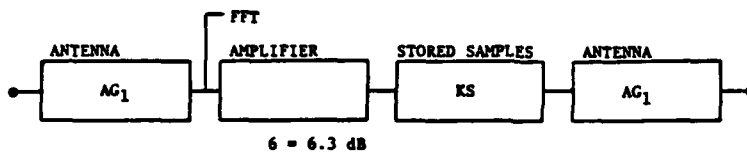
April 4, 1985

ACCEPTANCE TEST 8: STORED AND PLAYBACK SAMPLES

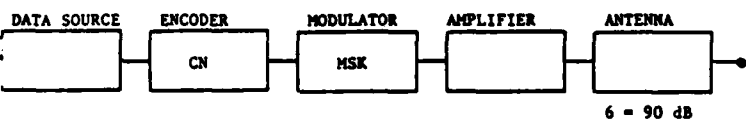
TRANSMITTER (1) STORED SAMPLES



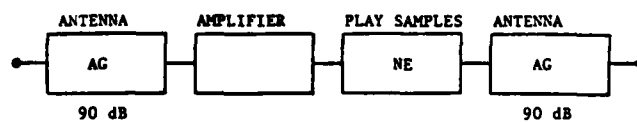
SATELLITE (1) STORED SAMPLES



TRANSMITTER (2) MSK



SATELLITE (2)



RECEIVER (2) MSK

EXPECTED BER

0

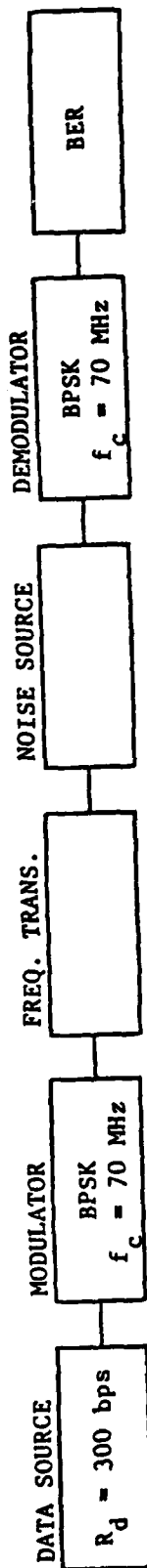
MEASURED BER

0

1024 bits

Performed by: Yuan H. Smith
 Witnessed by: J.E. Beckert
 Date: June 1985

ACCEPTANCE TEST 9: OSCILLATOR PHASE NOISE



DEMODULATOR PARAMETERS:

TLL = 0.1 Hz Decision Feedback, $z = .707$
 PLL = 10.89 Hz Decision Feedback, 2nd order, $z = .707$
 No Limiter at 0. dBW
 Signal Level = 0 dB
 I&D Detection

OSCILLATOR SPECTRAL CHARACTERISTICS:

$H_0 = 1.26$ E-10 Rad/Hz $H_2 = 0.01$ Rad·Hz
 $H_1 = 0$ Rad $H_3 = .2$ Rad·Hz

RESULTS:

RUN	Eb/No (dB)	TO	N. BITS	EXPECTED VARIABLE	MEASURED VARIABLE
1	-	0		-17.2	-26.17dB
2	1.3	1.79×10^{70}		-15.1	-14.64dB

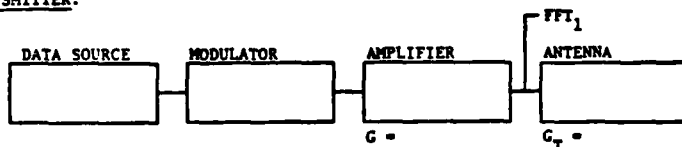
Performed by: James H. Shults

Witnessed by: L. E. Becht

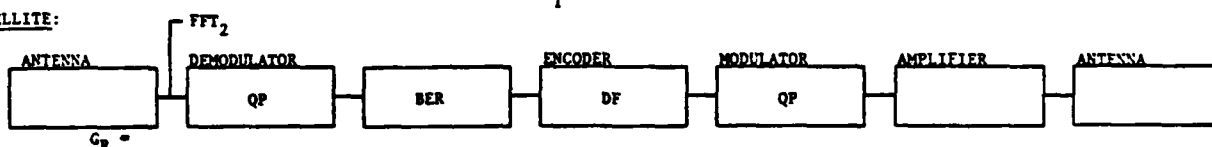
Date: 4 April 1985

ACCEPTANCE TEST 10: DEMODULATOR

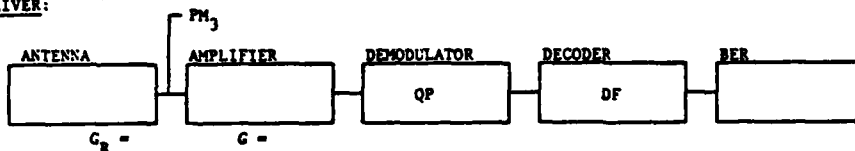
TRANSMITTER:



SATELLITE:



RECEIVER:



DEVICE PARAMETERS:

Data Rate =

MODULATOR/DEMODULATOR UPLINK

$f_c = 8 \text{ GHz}$
 QPSK
 TLL = $z = .707$
 PLL = $z = .707$
 1&D Detection
 Hard Decision
 Min. Signal = 0 dB

MODULATOR/DEMODULATOR DOWNLINK

$f_c = 8 \text{ GHz}$
 QPSK
 TLL =
 PLL =
 1&D Detection
 Hard Decision
 Min. Signal = 0 dB

RESULTS:

EXPECTED BER	MEASURED BER	$P_1 \text{ (dB)}$	$P_2 \text{ (dB)}$	$P_3 \text{ (dB)}$
0	0	-	-12.1dB	-16.3dB

1024 bits
 1000 bits

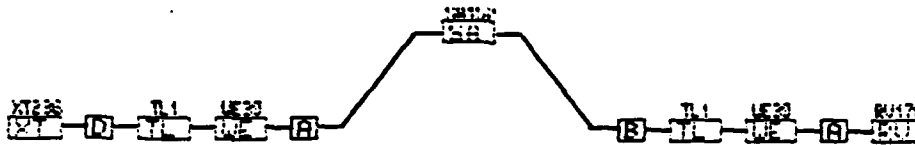
Performed by:

Witnessed by:

Date:

ACCEPTANCE TEST 11: ATMOSPHERIC EFFECTS

Test Configuration: SY53, XT236, SA152, RV176



Simulation Frequency: 10 GHz

Atmospheric Absorption Water Vapor Density: 0 gm/m³

Cloud Attenuation Water Vapor Density:

Cloud Thickness:

Cloud Temperature:

Rainfall Zone: D₁

Time Availability: 0.9999

0° Isotherm Height: 4 km

Cross-Polarization: Linear Horizontal Tilt Angle: 30°

RESULTS

<u>Atmospheric Effect</u>	<u>Expected</u>	<u>Measured</u>
Atmospheric Absorption:	0.21	.11
Cloud Attenuation:	23.91	23.11
Rain Attenuation:	36.766	36.766
Cross-Polarization Loss:	—	

Performed by:

JF O'Connell

Witnessed by:

JE Beckert

Date:

April 4, 1965

ATTENUATION CALCULATIONS (EQUATIONS IN REFERENCE 7)

Cloud Attenuation:

$$A_c \text{ (dB)} = 5 \times 10^{-25} \times M \times L \times F^2 \exp(0.0281(291-T)) \csc \beta$$

$$M = 15 \text{ g/m}^3$$

$$L = 10,000 \text{ m}$$

$$F = 10 \text{ GHz} = 10^{10} \text{ Hz}$$

$$T = 300 \text{ K}$$

$$\beta = 14.099^\circ$$

$$A_c \text{ (dB)} = 23.91$$

Atmospheric Absorption

$$\text{Total Zenith Attenuation (From Table 1)} = 0.051$$

$$\beta = 14.099^\circ$$

$$A_a \text{ (dB)} = \text{TZA} \csc \beta$$

$$= 0.21$$

Rain Attenuation

$$R_p = 37 \text{ mm/hr (Zone D}_1\text{, Availability} = 0.9999, \text{ Table 2)}$$

$$\text{Elevation Angle} = 14.099^\circ$$

$$D = 15.925$$

$$v = 4.249$$

$$a = 0.0125 \text{ (From Table 3)}$$

$$u = 0.803$$

$$b = 1.18 \text{ (From Table 3)}$$

$$A_{sp} = 35.660$$

$$a R_p^b = 0.89$$

$$A_R = 36.768$$

$$c = -0.082$$

$$d = 1.633$$

ACCEPTANCE TEST 12A: NUCLEAR EFFECTS WITH CW JAMMERS

DEVICE PARAMETERS

MODULATORS

CW₁ at f_c = 7990 MHz

CW₂ at f_c = 8010 MHz

FILTER

11 Pole CS

3 dB = 30 MHz

F_c = 8000 MHz

0.01 dB Ripple

ANTENNAS

90 dB Antenna Gain

AMPLIFIER

Gain = 25 dB

Propagation Anomalies Device

(Attached)

Performed by:

Witnessed by:

Date:

James S. Shultz
J. E. Buckner
4 Apr 85

ACCEPTANCE TEST 12C: NUCLEAR EFFECTS ON BPSK

DEVICE PARAMETERS

Data Source = 10 Kbps

BPSK MODULATOR/DEMODULATOR

F_c = 8000 MHz

TLL = 0 Hz, DF, z = 0.707

PLL = 0 Hz, DF, z = 0.707 2nd Order

No AGC

No Limiter

Min. Sig. Level = 0 dB

Hard Decision

RESULTS

OBSERVED BER

Received Signal Power =

Received Noise Power =

SNR =

BER Estimate =

Performed by:

Witnessed by:

Date:

AMPLIFIER

G = 200 dB

ANTENNAS (Antenna Gain)

TX Uplink Gain = 20 dB

RX Uplink Gain = 20 dB

PROPAGATION ANOMALIES DEVICE

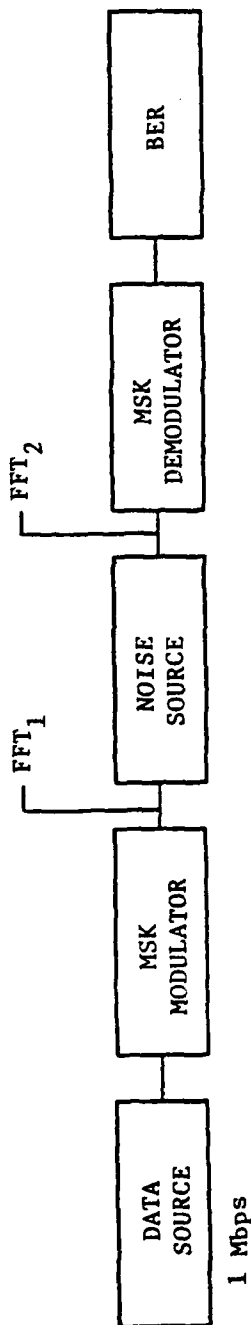
(Attached)

NO. BITS

2048 1=100 500-1000

James F. Hill
W. S. Beckett
4 April 1985

PHASE II ACCEPTANCE TESTS 7 and 8: MSK



1 Mbps

TEST	E_b/N_o (dB)	EXPECTED BER	MEASURED BER	ACCURACY	P_1	P_2	NBITS
7	3	3.2×10^{-2}	3.12×10^{-2}	+0.63%	0	5.38	11876
8	5	1×10^{-2}	1×10^{-2}	± 0%	0.16	4.06dB	34814

DEVICE PARAMETERS:

DEMODULATOR: MSK

$f_c = 100$ MHz
 TLL Bandwidth = .1 Hz $z = .707$
 PLL Bandwidth = 1 Hz $z = .707$
 No Limiter
 I&D Detector
 Min. Sig. Level = 0 dB

NOISE SOURCE: TEST 7: $T0 = 5.63E16$ 'K

TEST 8: $T0 = 2.29E16$ 'K.

Performed by: James H. Williams

Witnessed by: W. E. Beckett

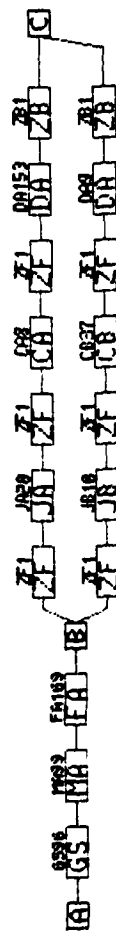
Date: 4 April 1985

APPENDIX B - ACCEPTANCE TEST DEVICE PARAMETERS

ACCEPTANCE TEST 2

TEST OF PN AND FH SPREAD

XT89



SW SVS

System Name : SVS
Editor Name : D0022
Creation Date : 8 Mar 85
Date of Last Run/Restart : 20 Mar 85
of Transmit Terminals : 1
of Receive Terminals : 0
of Satellites : 0
of Transmission Paths : 1
xxxxPRIU.DAT: RLPH: -1 PFLAG: 6
STPTR: 369
Linkage Specification : BT
TDMA Devices : (None)
Demand Access Devices : (None)

SVS Descriptor: ACCEPT TEST 2

Xmit Recv
Elem Code Path Devices
1 XT89 0 Cx (None)

Display Associated Device Linkage? (Y/N): Y

#	Orig Device	Dest Device
1	XT89 1AB1	XT89 1BC7
2	XT89 1AB2	XT89 1BC6
3	XT89 1BC2	XT89 1BC4
4	XT89 1AB1	XT89 2BC7
5	XT89 1AB2	XT89 2BC6
6	XT89 2BC2	XT89 2BC4

xxxxPRIU.SYST: Display Simulation Status Fields? (Y/N): Y

System 6 Run Status : NORMAL END Interrupt Status : CLEAR
Simulation Run Title : (ACCEPT TEST 2: PH AND FH ON BPSK NO NOISE)
Simulation Progress : >

- State : CLEAR
- Elapsed Time : 1.09227E-04 Seconds
- Sample Blocks : 8
- Percent Complete : 100.000 %
Sampling Frequency : 1.50000E+08 Samples/Sec
Restart Specified : NO
Number Messages Issued : 0
xxxxPRIU.DAT :
- Run Parameter Set : 6
- Checkpoint Status : CRNONE

Enter FSCSS Command:

- XT89

Element Name : XT89
Editor Name : D0922
Creation Date : 8 Mar 85
Date of Last Use : 8 Mar 85
Current Uses : 1
Number of Segments : 3
xxxxPRIV.DATA: RLPNT: -1 PFLAG: 1
Latitude : 0 Deg 0 Min N
Longitude : 0 Deg 0 Min E
Altitude : 0.000 Kilometers

XT89 Descriptor: TEST OF PN AND FM SPREAD

Seg Dev
Code Count Devices
1 AB 3 GS96-NA99-FA169
2 BC 7 ZF1-JA20-ZF1-CAB-ZF1-DA153-ZB1
3 BIC 7 ZF1-JB10-ZF1-CB37-ZF1-DA9-ZB1

Enter FSCSS Command: SH GS96

Device Name : GS96
Editor Name : D0922
Creation Date : 5 Mar 85
Date of Last Use : 8 Mar 85
Current Uses : 8
Descriptor : TEST SPREADER PN
xxxxPRIV.DATA: RLPNT: -1
PFLAG: 8
DULOC: 0 0

Display User Parameters? (Y/N): Y

Data Source Parameter Name	Option or Range	Default Value	Current Value
xxxxPRIV.TEST: SOURCE TYPE	IG,EX,AG,A1	IG	IG
DATA RATE,KBPS	0.001 TO 1000000.000		1000.000

xxxxPRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

SH 0000

Device Name : MAG9
Editor Name : D0922
Creation Date : 4 Mar 85
Date of Last Use : 8 Mar 85
Current Uses : 10
Description :
xxxxPRIU.DAT: RLPT: -1
PFLAG: 10
DULOC: 0

Display User Parameters? (Y/N): Y

Modulator
Parameter Name

MODULATOR TYPE

Option or Range	Default Value	Current Value
BP, QP, 00, MS, DP, BP, 16, AP, FS, CP, PM, FM, PF, CU, FH, PU		BP
0.001 TO 100000.000		3000.000

FREQUENCY, MHZ

xxxxPRIU.DAT/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH FA169

Device Name : FA169
Editor Name : D0922
Creation Date : 5 Mar 85
Date of Last Use : 8 Mar 85
Current Uses : 3
Description :
xxxxPRIU.DAT: RLPT: -1
PFLAG: 3
DULOC: 0

Display User Parameters? (Y/N): Y

Filter
Parameter Name

FILTER TYPE

Option or Range	Default Value	Current Value
CS, BU, BT, BE, LE, PR, PZ, FS		CS
0.001 TO 100000.000		3000.000
0.001 TO 999.999		2.000
1 TO 30		11
0.000 TO 3.000		0.010

CENTER FREQUENCY, MHZ

3-DB BANDWIDTH, MHZ

NO. OF POLES
RIPPLE FACTOR, DB

xxxxPRIU.DAT/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

CB37

Device Name : CB37
 Editor Name : D0922
 Creation Date : 8 Mar 85
 Date of Last Use : 8 Mar 85
 Current User : 3
 Descriptor : TEST FH DESPREADER
 xxxpriu.data: RLPM: -1
 PFLAG: 3
 DULOC: 0 0

Display User Parameters? (Y/N): Y

Despreader Parameter Name	Option or Range	Default Value	Current Value
DESPREADER TYPE	PN,FH,PF		FM
CENTER FREQUENCY, MHZ	0.001 TO 100000.000		3000.000
HOPPING FREQUENCY SPACING, MHZ	0.001 TO 1000.000		4.000
POWER OF 2 FOR NO OF HOP FREQ	1 TO 20		3
FREQUENCY HOPPING RATE, MHZ	1.000000E-06 TO 9.999999E+01		1.000
LENGTH FH-PR GENERATOR	10 TO 31	10	10
SEED FH-PR GENERATOR	2147483647		12345
MODIFY HOP ADDRESS	YE,NO		YE
HOP MODIFIER BIT 1	0, 1		1
HOP MODIFIER BIT 2	0, 1		0
HOP MODIFIER BIT 3	0, 1		1

xxxxpriu.data/test: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

SN J310

Device Name : J310
 Editor Name : D022
 Creation Date : 8 Mar 85
 Date of Last Use : 8 Mar 85
 Current User : 3
 Description : TEST FH/PSK
 xxxpriu.data: RLPT: -1
 PFLAG: 3
 DULOC: 0 0

Display User Parameters? (Y/N): Y

Spreader Parameter Name	Option or Range	Default Value	Current Value
SPREADER TYPE	PH, FH		FH
FREQUENCY, MHZ	0.001 TO 100000.000		8000.000
HOPPING FREQ SPACING, MHZ	0.001 TO 999.999		4.000
POWER OF 2 FOR NO OF HOP FREQ	1 TO 20		3
FREQ HOPPING RATE, MHZ	1.000000E-06 TO 9.999999E+01		1.000
LENGTH FH-PR GENERATOR	10 TO 31	10	10
SEED FH-PR GENERATOR	2147483647		12345
MODIFY HOP ADDRESS	YE, NO		YE
HOP MODIFIER BIT 1	0, 1		1
HOP MODIFIER BIT 2	0, 1		0
HOP MODIFIER BIT 3	0, 1		1

xxxxpriu.data/test: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

SH JA20

Device Name : JA20
Editor Name : D0922
Creation Date : 4 Mar 85
Date of Last Use : 8 Mar 85
Current User : 4
Description : TEST PN SPREADER
xxxxPRIV.DATA: RLPMT: -1
PFLAG: 4
DULOC: 0 0

Display User Parameters? (Y/N): Y

Spreader Parameter Name	Option or Range	Default Value	Current Value
SPREADER TYPE	PN, FH		PN
FREQUENCY, MHZ	0.001 TO 100000.000		2000.000
CHIP RATE, MHZ	0.001 TO 999.999		40.000
LENGTH IN-PHASE, GEN	10 TO 31		31
LENGTH QUAD GEN	10 TO 31		31
SEED IN-PHASE GEN	1 TO 2147483647		14656
SEED QUAD GEN	1 TO 2147483647		14854

xxxxPRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

SH CAB

Device Name : CAB
 Editor Name : D022
 Creation Date : 4 Mar 85
 Date of Last Use : 8 Mar 85
 Current User : 4
 Descriptor : TEST DESPREADER
 333PRU.DAT: RLPT: -1
 PFLAG: 4
 DULOC: 0 0

Display User Parameters? (Y/N): Y

Despreader Parameter Name	Option or Range	Default Value	Current Value
DESPREADER TYPE	PH,FM,PF		PN
CENTER FREQUENCY, MHZ	0.001 TO 100000.000		8000.000
CHIP RATE, MHZ	0.001 TO 1000.000		40.000
LENGTH IN-PHASE GENERATOR	10 TO 31		31
LENGTH QUADRATURE GENERATOR	10 TO 31		31
SEED IN-PHASE GENERATOR	1 TO 2147483647		14656
SEED QUADRATURE GENERATOR	1 TO 2147483647		14854
BANDWIDTH OF TIMING LOCK LOOP	0.010 TO 1000000.000		0.100
DAMPING FACTOR TIM. LOCK LOOP	0.010 TO 10.000	0.707	0.707
FILTER 3DB BANDWIDTH, MHZ	0.001 TO 1000.000		10.000

333PRU.DAT/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

Da9

Device Name : DA9
 Editor Name : D9922
 Creation Date : 5 Mar 85
 Date of Last Use : 8 Mar 85
 Current Uses : 3
 Description : TEST DESPREADERS
 xxxpriu.data: RLPM1: -1
 PFLAG: 3
 DULOC: 0 0

Display User Parameters? (Y/N): Y

Demodulator Parameter Name	Option or Range	Default Value	Current Value

DEMODULATOR TYPE			
FREQUENCY, MHZ	BP, DP, OP, OQ, BP, 16, FS, MS, CP, AP, PN, FM, PF		BP
TYPE-TIMING LOCK LOOP	1000000.000		8000.000
BANDWIDTH-TIMING LOCK LOOP, MZ	DF, PU		DF
DAMPING FACTOR-TIMING LOCK LOOP	1000000.000		0.100
TYPE-PHASE LOCK LOOP	0.000 TO		
ORDER-PHASE LOCK LOOP	0.010 TO	0.707	0.707
BANDWIDTH-PHASE LOCK LOOP, MZ	9.990		2
DAMPING FACTOR-PHASE LOCK LOOP	DF, PU		DF
ACC-TIMING & PHASE LOCK LOOPS	2, 3		1.000
LIMITATION AT ZERO DBU	1000000.000		0.707
MINIMUM SIGNAL LEVEL, DBU	0.010 TO		NO
DECISION TYPE	9.990		NO
DETECTOR TYPE	YE, PL, NO		NO
	YE, NO	0.707	NO
	-200.000 TO		HA
	0.000		ID
	HA, SO		
	ID, FS		

xxxxpriu.data/test: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

DA153

Device Name : DA153
 Editor Name : D0922
 Creation Date : 4 Mar 85
 Date of Last Use : 8 Mar 85
 Current User : 4
 Description : TEST DEMOD
 \$\$\$PRIV.DATA: ALPNT: -1
 PFLAG: 4
 DULOC: 0 0 0

Display User Parameters? (Y/N): Y

Demodulator

Parameter Name

DEMODULATOR TYPE

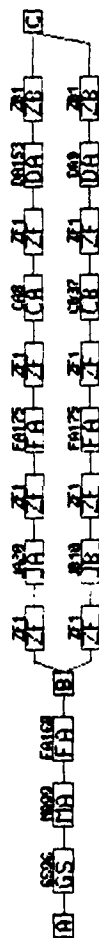
Option or Range	Default Value	Current Value
BP, DP, QP, 00, BP, 16, FS, MS, CP, AP, PH, FH, PF		BP
100000.000		8000.000
DF, PU		DF
1000000.000		0.100
0.018 TO 9.990	0.707	0.707
DF, PU		DF
2, 3		2
1000000.000		10.000
0.018 TO 9.990	0.707	0.707
VE, PL, NO		NO
VE, NO		NO
-200.000 TO 0.000		0.000
HA, SO		HA
ID, FS		ID

\$\$\$PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

ACCEPTANCE TEST 3

XT169



SM SY60

System Name : SY60
 Editor Name : D9522
 Creation Date : 8 Mar 85
 Date of Last Run/Restart : 20 Mar 85
 # of Transmit Terminals : 1
 # of Receive Terminals : 0
 # of Satellites : 0
 # of Transmission Paths : 1
 zzzsppriu.data: ALPMT: -1 PFLAG: 5
 BPPTR: 377
 Linkage Specification : BT
 TDMA Devices : (None)
 Demand Access 'Devices' : (None)

SY60 Descriptor: ACCEPT TEST 3

Xmit Recv Transmission
 # Elem Code Path Devices
 1 XT169 0 CX (None)

Display Associated Device Linkage? (Y/N): Y

Orig Device	Dest Device
1 XT169 1AB1	XT169 1BC9
2 XT169 1AB2	XT169 1BC8
3 XT169 1AB2	XT169 2BC8
4 XT169 1BC2	XT169 1BC6
5 XT169 2BC2	XT169 2BC6
6 XT169 1AB1	XT169 2BC9

zzsppriu.syst: Display Simulation Status Fields? (Y/N): Y

System 60 Run Status : CANCELLED Interrupt Status : CLEAR
 Simulation Run Title : <ACCEPT TEST 3 POLES AND ZEROS FILTER.
 Simulation Progress . . : CLEAR
 - State : CLEAR
 - Elapsed Time : 4.095600E-05 Seconds
 - Sample Blocks : 3
 - Percent Complete : 39.000 %
 Sampling Frequency : 1.50000E+08 Samples/Sec
 Restart Specified : NO
 Number Messages Issued : 3
 zzzsppriu.data :
 - Run Parameter Set : 60
 - Checkpoint Status : CRNONE
 Enter FSCSS Command:

4 XT169

Element Name : XT169
Editor Name : D9522
Creation Date : 8 Mar 85
Date of Last Use : 8 Mar 85
Current Uses : 1
Number of Segments : 3

xxxxxxIU.DAT: RLPH: -1 PFLAG: 1

Latitude : 0 Deg 0 Min N
Longitude : 0 Deg 0 Min E
Altitude : 0.000 Kilometers

XT169 Descriptor: ACCEPT TEST 3

Seg	Code	Count	Dev	Device
1	AB	3		CS96-NA99-FA169
2	BC	9		ZF1-JA20-ZF1-FA175-ZF1-CAB-ZF1-DA153-ZB1
3	BBC	9		ZF1-JB10-ZF1-FA175-ZF1-CB37-ZF1-DA9-ZB1

Enter FSCSS Command:

```

Device Name      : FA175
Editor Name      : D002Z
Creation Date    : 14 Mar 85
Date of Last Use : 14 Mar 85
Current User     : 6
Descriptor       :
XXXXXXXXXX.DATA: 1 TEST PZ DCS111
                  RUNIT: -1
                  PFLAG: 6
                  BULOG: 0

```

```

- - IMAGINARY ZERO      -0.999999E+37 TO
                        9.999999E+37

ZERO 2      8.765

- - REAL ZERO          -0.999999E+37 TO
                        9.999999E+37

- - IMAGINARY ZERO      -0.999999E+37 TO
                        9.999999E+37

-8.765

```

*****PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N):

Display User Parameters? (Y/N): Y

Filter Parameter Name	Option or Range	Default Value	Current Value

FILTER TYPE	CS,BU,BT,BE,LE, PR,PZ,FS		PZ
CENTER FREQUENCY, MHZ	100000.000		8000.000
3-DB BANDWIDTH, MHZ	999.999		51.600
NO. OF POLES	4 TO 30		6
NO. OF ZEROS	1 TO 30		2
POLE 1			
- REAL POLE	- 9.999999E+37 TO		
- IMAGINARY POLE	9.999999E+37 TO		-2.295
POLE 2			
- REAL POLE	- 9.999999E+37 TO		
- IMAGINARY POLE	9.999999E+37 TO		-2.295
POLE 3			
- REAL POLE	- 9.999999E+37 TO		
- IMAGINARY POLE	9.999999E+37 TO		-5.385
POLE 4			
- REAL POLE	- 9.999999E+37 TO		
- IMAGINARY POLE	9.999999E+37 TO		-3.778
POLE 5			
- REAL POLE	- 9.999999E+37 TO		
- IMAGINARY POLE	9.999999E+37 TO		-3.778
POLE 6			
- REAL POLE	- 9.999999E+37 TO		
- IMAGINARY POLE	9.999999E+37 TO		-2.138
POLE 7			
- REAL POLE	- 9.999999E+37 TO		
- IMAGINARY POLE	9.999999E+37 TO		-0.643
POLE 8			
- REAL POLE	- 9.999999E+37 TO		
- IMAGINARY POLE	9.999999E+37 TO		-6.624
POLE 9			
- REAL POLE	- 9.999999E+37 TO		
- IMAGINARY POLE	9.999999E+37 TO		-0.643
ZERO 1			
- REAL ZERO	- 9.999999E+37 TO		6.624
- IMAGINARY ZERO	9.999999E+37 TO		0.000

4 FA175

Device Name : FA175
 Editor Name : D0922
 Creation Date : 14 Mar 85
 Date of Last Use : 14 Mar 85
 Current User : 6
 Description : TEST P2 DSCSIII
 222P2U.DAT: RLPT: -1
 PFLAG: 6
 DVLOC: 0 0

Display User Parameters? (Y/N): Y

Filter Parameter Name	Option or Range	Default Value	Current Value

FILTER TYPE	CS, BU, BT, BE, LE, PR, PZ, FS		PZ
CENTER FREQUENCY, MHZ	0.001 TO 100000.000		8000.000
3-DB BANDWIDTH, MHZ	0.001 TO 999.999		61.600
NO. OF POLES	4 TO 30		6
NO. OF ZEROS	1 TO 30		2
POLE 1			
- REAL POLE	-9.999999E+37 TO 9.999999E+37		-2.295
- IMAGINARY POLE	-9.999999E+37 TO 9.999999E+37		5.385
POLE 2			
- REAL POLE	-9.999999E+37 TO 9.999999E+37		-2.295
- IMAGINARY POLE	-9.999999E+37 TO 9.999999E+37		-5.385
POLE 3			
- REAL POLE	-9.999999E+37 TO 9.999999E+37		-3.778
- IMAGINARY POLE	-9.999999E+37 TO 9.999999E+37		2.138
POLE 4			
- REAL POLE	-9.999999E+37 TO 9.999999E+37		-3.778
- IMAGINARY POLE	-9.999999E+37 TO 9.999999E+37		-2.138
POLE 5			
- REAL POLE	-9.999999E+37 TO 9.999999E+37		-0.643
- IMAGINARY POLE	-9.999999E+37 TO 9.999999E+37		-6.624
POLE			

POLE 0		
- REAL POLE	-9.999999E+37 TO	-0.643
	9.999999E+37	
- IMAGINARY POLE	-9.999999E+37 TO	6.624
	9.999999E+37	
ZERO 1		
- REAL ZERO	-9.999999E+37 TO	0.000
	9.999999E+37	
- IMAGINARY ZERO	-9.999999E+37 TO	8.765
	9.999999E+37	
ZERO 2		
- REAL ZERO	-9.999999E+37 TO	0.000
	9.999999E+37	
- IMAGINARY ZERO	-9.999999E+37 TO	-8.765
	9.999999E+37	

xxxxPRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command!

ACCEPTANCE TEST 4

SYNCH HARD, 8FSK
XT36



```

SH ST36
Element Name : XT36
Editor Name : FSCSS2
Creation Date : 18 Mar 85
Date of Last Use : 23 Mar 85
Current Uses : 1
Number of Segments : 1

XXXXPRIU.DATA/TEST: DISPLAY ALL FIELDS? (Y/N):

XXXXPRIU.DATA: RLPT: -1 PFLAG: 1
Latitude : 0 Deg 0 Min N
Longitude : 0 Deg 0 Min E
Altitude : 0.000 Kilometers

XT36 Descriptor: SYNCH HARD, BPSK

Sag Dev
# Code Count Devices
1 AB 9 GS95-E16-MD93-2F1-LM1-DD91-ZB1-V111-ZB1

Enter FSCSS Command: SH GS95

Device Name : GS95
Editor Name : D0279
Creation Date : 28 Jan 85
Date of Last Use : 2 Apr 85
Current Uses : 33
Descriptor : 2.4 KBPS FOR SYNCH INTER
XXXXPRIU.DATA: RLPT: -1
PFLAG: 33
DULOC: 0 0

Display User Parameters? (Y/N): Y

Data Source
Parameter Name
-----
XXXXPRIU.TEST: SOURCE TYPE
DATA RATE,KBPS
Option or Range
-----
IG,EX,AG,A1
0.001 TO
100000.000
Current Value
-----
IG
2.400

XXXXPRIU.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH E16

Device Name : E16
Editor Name : D0279
Creation Date : 22 Mar 85
Date of Last Use : 26 Mar 85
Current Uses : 11
Descriptor : 6 X 13 SYNCH INTLUR
XXXXPRIU.DATA: RLPT: -1
PFLAG: 11
DULOC: 0 0

Display User Parameters? (Y/N): Y

Encoder
Parameter Name
-----
ENCODER TYPE
NUMBER OF TAPS
OUTPUT BIT SEPARATION
Option or Range
-----
DF,CH,B1,S1,B5
1 TO 99
13 TO 501
Current Value
-----
S1
6
13

```

SM MD93

Device Name : MD93
Editor Name : FSC52
Creation Date : 23 Mar 85
Date of Last Use : 26 Mar 85
Current Uses : 7
Descriptor : 150 MHZ, 50.1 KHZ, 8-FSK
xxxxPRIV.DAT: PLMT: -1
PFLAG: 7
DULOC: 0 0

Display User Parameters? (Y/N): Y

Modulator
Parameter Name

MODULATOR TYPE

Option or Range Default Value Current Value

BP,OP,OO,MS,DP,
SP,16,AP,FS,CP,
PN,FN,PF,CU,FH,
PU

FS

0.001 TO
100000.000

150.000

FREQUENCY, MHZ

ALPHABET SIZE

2,
8,
16

8

FREQUENCY SPACING,KHZ

0.001 TO
9999.999

50.100

INPUT SYMBOL TYPE

BI,SY

BI

xxxxPRIV.DAT/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSC55 Command:

SM DD91

Device Name : DD91
 Editor Name : FSCSS2
 Creation Date : 28 Mar 85
 Date of Last Use : 22 Mar 85
 Current Uses : 5
 Description : 150.50.1 KHZ. 8-FSK. NA
 xxxPRIV.DAT: RLPH: -1
 PFLAG: S
 DULOC: 0 0

Display User Parameters? (Y/N): Y

Demodulator Parameter Name	Option or Range	Default Value	Current Value
DEMODULATOR TYPE	BP,DP,OP,QQ,RP, 15,FS,MS,CP,AP, PN,FH,PP		FS
FREQUENCY, MHZ	0.001 TO 100000.000		150.000
ALPHABET SIZE	2, 4, 8, 15		8
FREQUENCY SPACING, KHZ	0.001 TO 9999.999		50.100
BANDWIDTH-TIMING LOCK LOOP, KZ	0.000 TO 1000000.000		0.000
DAMPING FACTOR-TIMING LOOP	0.010 TO 9.990	0.707	0.707
AGC-TIMING LOCK LOOP LIMITATION AT ZERO DBU DECISION TYPE	YE,NO YE,NO NA,50		NO YE NA

xxxxPRIV.DAT:TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

SN V111

Device Name : V111
Editor Name : D6279
Creation Date : 2 Apr 85
Date of Last Use : 22 Mar 85
Current Uses : 9
Descriptor : 6 X 13 SYNC, HARD
xxxxPRIV.DATA: RLPM: -1
PFLAG: 9
DULOC: 0 0

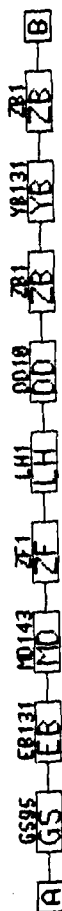
Display User Parameters? (Y/N): Y

Decoder Parameter Name	Option or Range	Default Value	Current Value
----- DECODER TYPE	DF,CN,BI,SI,SB		SI
NUMBER OF TAPS	1 TO 99		6
OUTPUT BIT SEPARATION	13 TO 501		13
INPUT SYMBOL DECISIONS	HA,SO		HA

xxxxPRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N):

ACCEPTANCE TEST 5

BLOCK, HARD, 8-FSK
XT157



```

Enter FSCSS Command: ah xt157

Element Name      : XT157
Editor Name       : FSCSS2
Creation Date     : 28 Mar 85
Date of Last Use  : 28 Mar 85
Current Uses      : 0
Number of Segments : 1

xxxxPRIU.DAT: RLPT: -1 PFLAG: 0
Latitude : 0 Deg 0 Min N
Longitude : 0 Deg 0 Min E
Altitude : 0.000 Kilometers

AT157 Descriptor: BLOCK, WARD, 8-FSK

  Seg  Dev
  Count Devices
1 AB 9 G595-EB131-MD143-ZF1-LH1-DD10-ZB1-YB131-ZB1

Enter FSCSS Command: ah gs95

Device Name      : GS95
Editor Name      : D0279
Creation Date    : 28 Jan 85
Date of Last Use : 2 Apr 85
Current Uses     : 34
Descriptor       : 2.4 KBPS FOR SYNCH INTER
xxxxPRIU.DAT: RLPT: -1
PFLAG: 34
DULOC: 0 0 0

Display User Parameters? (Y/N): Y

Data Source
Parameter Name
-----
xxxxPRIU.TEST: SOURCE TYPE      Option or Range Default Value Current Value
DATA RATE,KBPS                 1G,EX,A0,A1          1G          2.400
                                1000000.000

xxxxPRIU.DAT/TEST: DISPLAY ALL FIELDS? (Y/N): n

Enter FSCSS Command:

```

AD-A155 647

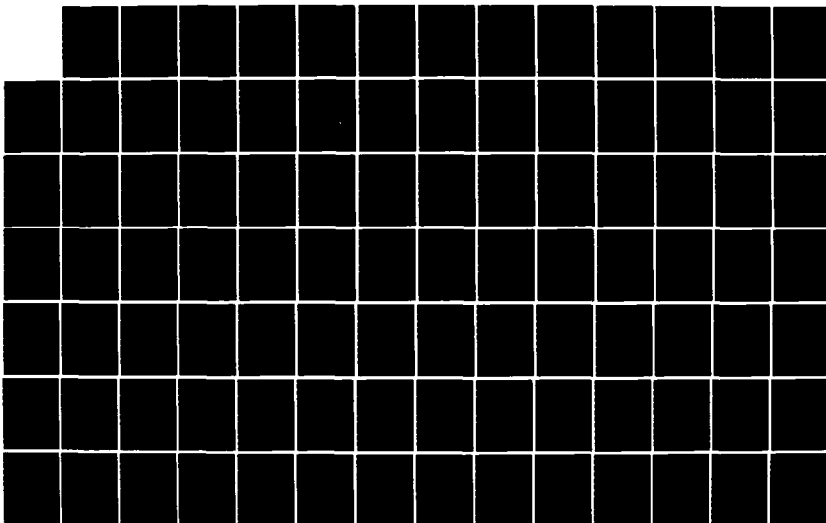
FLEXIBLE SATELLITE COMMUNICATIONS SYSTEMS SIMULATOR(U)
COMPUTER SCIENCES CORP FALLS CHURCH VA SYSTEMS DIV
D F ARNAUD ET AL. 16 MAY 85 DCA100-77-C-0020

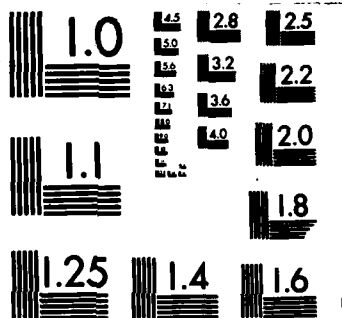
2/3

UNCLASSIFIED

F/G 17/2

NL





MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

Enter FSCSS Command: sh eb131

Device Name : EB131
 Editor Name : FSCSS2
 Creation Date : 28 Mar 85
 Date of Last Use : 28 Mar 85
 Current Uses : 1
 Description : 8 X 32 BLK, 2 REPS HARD
 #####PRIV.DATA: RLANT: -1
 PFLAG: 1
 DULOC: 0 0

Display User Parameters? (Y/N): Y

Encoder Parameter Name	Option or Range	Default Value	Current Value
ENCODER TYPE	DF,CH,BI,SI,BS		BI
NUMBER OF ROWS	1 TO 200		32
NUMBER OF COLUMNS	1 TO 300		32
NUMBER OF REPETITIONS	0 TO 15		2

#####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): n

Enter FSCSS Command: sh md93

Device Name : MD93
 Editor Name : FSCSS2
 Creation Date : 23 Mar 85
 Date of Last Use : 26 Mar 85
 Current Uses : 7
 Description : 150 MHZ, 50.1 KHZ, 8-FSK
 #####PRIV.DATA: RLANT: -1
 PFLAG: 7
 DULOC: 0 0

Display User Parameters? (Y/N): Y

Modulator Parameter Name	Option or Range	Default Value	Current Value
MODULATOR TYPE	BP,OP,OO,MS,DP, BP,IS,AP,FS,CP, PM,FH,PF,CU,FH, PU		FS
FREQUENCY, MHZ	0.001 TO 100000.000		150.000
ALPHABET SIZE	2, 4, 8, 16		8
FREQUENCY SPACING, KHZ	0.001 TO 9999.999		50.100
INPUT SYMBOL TYPE	BI,SV		BI

#####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): n

Enter FSCSS Command:

Enter FSCSS Command: sh dd91

Device Name : DD91
 Editor Name : FSCSS2
 Creation Date : 28 Mar 85
 Date of Last Use : 2 Apr 85
 Current Uses : 5
 Description : 150, 50.1 KHZ. 8-FSK. NA
 222PRIV.DAT: RLPT: -1
 PFLAG: 5
 DULOC: 0 0

Display User Parameters? (Y/N): y

Demodulator Parameter Name	Option or Range	Default Value	Current Value

DEMODULATOR TYPE			
	BP,DP,OP,OO,SP, 16,FS,MS,CP,AP, PN,FH,PF		FS
FREQUENCY, KHZ	0.001 TO 100000.000		150.000
ALPHABET SIZE	2, 8, 16		8
FREQUENCY SPACING, KHZ	0.001 TO 9999.999		50.100
BANDWIDTH-TIMING LOCK LOOP, HZ	0.000 TO 1000000.000		0.000
DAMPING FACTOR-TIMING LOOP	0.010 TO 0.990	0.707	0.707
ACC-TIMING LOCK LOOP LIMITATION AT ZERO DBU DECISION TYPE	VE,NO VE,NO HA,SO		NO VE HA

222PRIV.DAT/TEST: DISPLAY ALL FIELDS? (Y/N): n

Enter FSCSS Command:

Enter FSCSS Command: ah yb131

Device Name : YB131
Editor Name : FSCSS2
Creation Date : 28 Mar 85
Date of Last Use : 28 Mar 85
Current User : 1
Descriptor : 8 X 32 BLK, HARD 2 REPS
xxxxPRIU.DAT: RLPM: -1
RFLAG: 1
DULOC: 0 0

Display User Parameters? (Y/N): y

Decoder Parameter Name	Option or Range	Default Value	Current Value
DECODER TYPE	DF, CN, BI, SI, SB		BI
NUMBER OF ROWS	1 TO 200		8
NUMBER OF COLUMNS	1 TO 300		32
NUMBER OF REPETITIONS	0 TO 15		2
INPUT SYMBOL DECISIONS	HA, SO		HA

xxxxPRIU.DAT/TEST: DISPLAY ALL FIELDS? (Y/N): n

Enter FSCSS Command:

ACCEPTANCE TEST 7A

TEST PN-FH SOFT

TX58



--SY9

System Name : SY9
 Editor Name : FSCS2
 Creation Date : 18 Mar 85
 Date of Last Run/Restart : 26 Mar 85
 # of Transmit Terminals : 1
 # of Receive Terminals : 0
 # of Satellites : 0
 # of Transmission Paths : 1

xxxxPRIU.DAT: RLPNT: -1 PFLAG: 7
 BTPTR: 462

Linkage Specification : BT
 TDMA Devices : (None)
 Demand Access "Devices" : (None)

SY9 Descriptor: TEST PF SOFT

Xmit Recv Transmission
 # Elem Code Path Devices
 1 XT58 0 82 (None)

Display Associated Device Linkage? (Y/N): Y

#	Orig Device	Dest Device	Elem Position	Elem Position
1	XT58 IAB1	XT58 IAB9		
2	XT58 IAB3	XT58 IAB7		
3	XT58 IAB2	XT58 IAB8		

xxxxPRIU.SYST: Display Simulation Status Fields? (Y/N): N

Enter FSCS Command: SH XT58

Element Name : XT58
 Editor Name : FSCS2
 Creation Date : 18 Mar 85
 Date of Last Use : 18 Mar 85
 Current Uses : 1
 Number of Segments : 1

xxxxPRIU.DAT: RLPNT: -1 PFLAG: 1

Latitude : 0 Deg 0 Min N
 Longitude : 0 Deg 0 Min E
 Altitude : 0.000 Kilometers

XT58 Descriptor: TEST PM SOFT

Seg Dev
 # Code Count Devices
 1 AB 9 GS163-EC86-RH3-ZF1-FA196-ZF1-DH2-YU14-Z81

Enter FSCS Command:

08163

Device Name : GS163
 Editor Name : D0922
 Creation Date : 26 Mar 85
 Date of Last Use : 28 Mar 85
 Current User : 9
 Descriptor : TEST PN/FM SOFT
 xxxPRIU.DATA: RLPT: -1
 PFLAG: 9
 DULOC: 0 0

Display User Parameters? (Y/N): Y

Data Source
 Parameter Name

Parameter Name	Option or Range	Default Value	Current Value
xxxxPRIU.TEST: SOURCE TYPE	IG,EX,AG,A1	IG	IG
DATA RATE,KBPS	0.001 TO 100000.000		250.000

xxxxPRIU.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH FH3

Device Name : FH3
 Editor Name : D0922
 Creation Date : 26 Mar 85
 Date of Last Use : 28 Mar 85
 Current User : 9
 Descriptor : TEST SOFT DECISION
 xxxPRIU.DATA: RLPT: -1
 PFLAG: 9
 DULOC: 0 0

Display User Parameters? (Y/N): Y

Modulator
 Parameter Name

Parameter Name	Option or Range	Default Value	Current Value
MODULATOR TYPE	BP,OP,OO,MS,DP,SP,16,AP,FS,CP,PH,FH,PF,CU,FH,PU		PF
FREQUENCY, MHZ	0.001 TO 100000.000		3000.000
CHIP RATE, MHZ	0.001 TO 999.999		5.000
LENGTH IN-PHASE, GEN	10 TO 31		31
LENGTH QUID GEN	10 TO 31		31
SEED IN-PHASE GEN	1 TO 2147483647		101010101
SEED QUID GEN	1 TO 2147483647		101010101
HOPPING FREQ SPACING, MHZ	0.001 TO 999.999		5.000
POWER OF 2 FOR NO OF HOP FREQ	1 TO 20		2
FREQ HOPPING RATE, MHZ	1.000000E-06 TO 1.000000E-06		

9.999999E+01
 10 TO 31
 2147483647
 YE,NO

xxxxPRIU.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

Parameter Name	Option or Range	Default Value	Current Value
xxxxPRIU.TEST: SOURCE TYPE	IG,EX,AG,A1	IG	IG
DATA RATE,KBPS	0.001 TO 100000.000		250.000

SN FA196

Device Name : FA196
 Editor Name : D0922
 Creation Date : 26 Mar 85
 Date of Last Use : 28 Mar 85
 Current User : 8
 Description : TEST PM/FH SOFT
 \$\$\$PRIV.DATA: RLANT: -1
 PFLAG: 8
 DULOC: 0 0

Display User Parameters? (Y/N): Y

Filter Parameter Name	Option or Range	Default Value	Current Value

FILTER TYPE	CS,BU,BT,BE,LE, PR,PZ,FS		BU
CENTER FREQUENCY, MHZ	0.001 TO 100000.000		3000.000
3-DB BANDWIDTH, MHZ	0.001 TO 999.999		40.000
NO. OF POLES	1 TO 30		4

\$\$\$PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

Later FSCSS Commands:

DM2
 Device Name : DM2
 Editor Name : D0922
 Creation Date : 26 Mar 85
 Date of Last Use : 26 Mar 85
 Current User : 7
 Descriptor : TEST PF SOFT
 XXXXPRIV.DATA: RLPHNT: -1
 PFLAG: 7
 DULOC: 0 0

Display User Parameters? (Y/N): Y

Demodulator Parameter Name	Option or Range	Default Value	Current Value
DEMODULATOR TYPE	BP, DP, QP, OQ, BP, 16, FS, MS, CP, AP, PN, FH, PF		PF
FREQUENCY, MHZ	0.001 TO 100000.000		8000.000
CHIP RATE, MHZ	0.001 TO 999.999		5.000
LENGTH IN-PHASE GENERATOR	10 TO 31		31
LENGTH QUAD PN GENERATOR	10 TO 31		31
SEED IN-PHASE GENERATOR	1 TO 2147483647		101010101
SEED QUAD PN GENERATOR	1 TO 2147483647		101010101
HOPPING FREQ SPACING, MHZ	0.001 TO 999.999		5.000
POWER OF 2 FOR NO OF HOP FREQ	1 TO 20		2
FREQ HOPPING RATE, MHZ	1.000000E-06 TO 9.999999E+01		1.000
LENGTH FH-PR GENERATOR	10 TO 31	10	10
SEED FH-PR GENERATOR	1 TO 2147483647		1010101010
MODIFY HOP ADDRESS	YE, NO		NO
TYPE-TIMING LOCK LOOP	DF, PU		DF
BANDWIDTH-TIMING LOCK LOOP, HZ	0.000 TO 1000000.000		0.000
DAMPING FACTOR-TIMING LOOP	0.010 TO 9.999	0.707	0.707
TYPE-PHASE LOCK LOOP	DF, PU		DF
ORDER-PHASE LOCK LOOP	2, 3		2
BANDWIDTH-PHASE LOCK LOOP, HZ	0.000 TO 1000000.000		0.000
DAMPING FACTOR-PHASE LOOP	0.010 TO 9.999	0.707	0.707
ACC-TIMING & PHASE LOCK LOOPS	YE, PL, NO		NO
LIMITATION AT ZERO DBM	YE, NO		NO
MINIMUM SIGNAL LEVEL, DBM	-200.000 TO 0.000		-10.000
DECISION TYPE	MA, SO		SO

XXXXPRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

SN YU14

Device Name : YU14
 Editor Name : D0922
 Creation Date : 12 Mar 85
 Date of Last Use : 22 Mar 85
 Current User : 22
 Descriptor : TEST UA HARD
 1822PR10.DAT: RLPNT: -1
 PFLAG: 22
 DULOC: 0 0

Display User Parameters? (Y/N): Y

Decoder Parameter Name	Option or Range	Default Value	Current Value
DECODER TYPE	DF,CN,BI,SI,SB		CN
INPUT RATE	2 TO 4		2
OUTPUT RATE	1 TO 3		1
CONSTRAINT LENGTH	2 TO 9		7
1 POLYNOMIAL COEFFICIENT 1	0, 1		1
1 POLYNOMIAL COEFFICIENT 2	0, 1		1
1 POLYNOMIAL COEFFICIENT 3	0, 1		1
1 POLYNOMIAL COEFFICIENT 4	0, 1		1
1 POLYNOMIAL COEFFICIENT 5	0, 1		0
1 POLYNOMIAL COEFFICIENT 6	0, 1		0
1 POLYNOMIAL COEFFICIENT 7	0, 1		1
2 POLYNOMIAL COEFFICIENT 1	0, 1		1
2 POLYNOMIAL COEFFICIENT 2	0, 1		0
2 POLYNOMIAL COEFFICIENT 3	0, 1		1
2 POLYNOMIAL COEFFICIENT 4	0, 1		1
2 POLYNOMIAL COEFFICIENT 5	0, 1		0
2 POLYNOMIAL COEFFICIENT 6	0, 1		1
2 POLYNOMIAL COEFFICIENT 7	0, 1		1
STATE TRANS PATH MEMORY	20 TO 60		40
INPUT SYMBOL DECISIONS	HA,SO		SO
NO. OF QUANT BITS	2 TO 5		3
QUANT THRESH SPACING	UR,UD		UM
	0.100 TO 3.000		0.500
METRIC ASSIGNMENT 1			
-METRIC 1	0.000000E+00 TO 9.999999E+37		0.000
-METRIC 2	0.000000E+00 TO 9.999999E+37		7.000
METRIC ASSIGNMENT 2			
-METRIC 1	0.000000E+00 TO 9.999999E+37		1.000
-METRIC 2	0.00		

-METRIC 2	0.000000E+00 TO	6.000
METRIC ASSIGNMENT 3	9.999990E+37	
-METRIC 1	0.000000E+00 TO	2.000
-METRIC 2	9.999990E+37	
METRIC ASSIGNMENT 4	0.000000E+00 TO	5.000
-METRIC 1	9.999990E+37	
-METRIC 2	0.000000E+00 TO	3.000
METRIC ASSIGNMENT 5	9.999990E+37	
-METRIC 1	0.000000E+00 TO	4.000
-METRIC 2	9.999990E+37	
METRIC ASSIGNMENT 6	0.000000E+00 TO	3.000
-METRIC 1	9.999990E+37	
-METRIC 2	0.000000E+00 TO	5.000
METRIC ASSIGNMENT 7	9.999990E+37	
-METRIC 1	0.000000E+00 TO	2.000
-METRIC 2	9.999990E+37	
METRIC ASSIGNMENT 8	0.000000E+00 TO	6.000
-METRIC 1	9.999990E+37	
-METRIC 2	0.000000E+00 TO	1.000
	9.999990E+37	
	0.000000E+00 TO	7.000
	9.999990E+37	
	0.000000E+00 TO	0.000
	9.999990E+37	

xxxxPRIV.DAT/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

SN ECBS

Device Name : ECBS
 Editor Name : D9922
 Creation Date : 5 Mar 85
 Date of Last Use : 28 Mar 85
 Current User : 27
 Descriptor : TEST UA
 ***PRIU.DATA: RLPNT: -1
 PFLAG: 27
 DULOC: 0 0

Display User Parameters? (Y/N): Y

Encoder Parameter Name	Option or Range	Default Value	Current Value
ENCODER TYPE	DF, CN, BI, SI, BS		CN
INPUT RATE	1 TO 3		1
OUTPUT RATE	2 TO 4		2
CONSTRAINT LENGTH	2 TO 9		7
1 POLYNOMIAL COEFFICIENT 1	0.		1
1 POLYNOMIAL COEFFICIENT 2	0.		1
1 POLYNOMIAL COEFFICIENT 3	0.		1
1 POLYNOMIAL COEFFICIENT 4	0.		1
1 POLYNOMIAL COEFFICIENT 5	0.		0
1 POLYNOMIAL COEFFICIENT 6	0.		0
1 POLYNOMIAL COEFFICIENT 7	0.		1
2 POLYNOMIAL COEFFICIENT 1	0.		1
2 POLYNOMIAL COEFFICIENT 2	0.		0
2 POLYNOMIAL COEFFICIENT 3	0.		1
2 POLYNOMIAL COEFFICIENT 4	0.		1
2 POLYNOMIAL COEFFICIENT 5	0.		0
2 POLYNOMIAL COEFFICIENT 6	0.		1
2 POLYNOMIAL COEFFICIENT 7	0.		1

***PRIU.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

ACCEPTANCE TEST 7B

TEST 7A SOFT DECISION FH
XT57

A GS GS25 EC86 NC30 ZF ZF1 FA194 ZF1 ZF1 OG6 YS64 YU14 ZL ZL B

```

System Name      : SY7
Editor Name      : FSCSS2
Creation Date    : 18 Mar 85
Date of Last Run/Restart : 26 Mar 85
# of Transmit Terminals : 0
# of Receive Terminals : 0
# of Satellites    : 0
# of Transmission Paths : 0
Linkage Specification : BT
TDMA Devices       : (None)
Demand Access 'Devices': (None)

```

Call	Xalt Elem	Recv Elem	Code	Transmission Path Devices (None)
8	XT57	0	BZ	

	Orig	Device	Dest	Device
	Elem	Position	Elem	Position
0	XT57	1AB1	XT57	1AB10
1	XT57	1AB2	XT57	1AB9
2	XT57	1AB2	XT57	1AB7

```

Element Name      : XT57
Editor Name       : FSC552
Creation Date      : 18 Mar 85
Date of Last Use  : 18 Mar 85
Current Uses      : 1
Number of Segments : 1

*****PRIU.DATA: RLPNT: -1 PFLAG: 1

Latitude : 0 Deg 0 Min N
Longitude : 0 Deg 0 Min E
Altitude : 0.000 Kilometers

```

Sag Code	Dev Count	Devices
AB	10	G535-EC86-MG39-ZF1-FA194-ZF1-DG25-YS64-YU14-ZB1

Enter FSCSS Command:

4 0835
 Device Name : GS35
 Editor Name : D0922
 Creation Date : 26 Mar 85
 Date of Last Use : 28 Mar 85
 Current Uses : 7
 Description : TEST
 zssSPRIU.DATA: RLPM: -1
 PFLAG: 7
 DULOC: 0

500.000
 INPUT SYMBOL TYPE
 SV

9999.999
 BI.SV

zssSPRIU.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N
 Enter FSCSS Command:

Display User Parameters? (Y/N): Y

Data Source Parameter Name	Option or Range	Default Value	Current Value
zssSPRIU.TEST: SOURCE TYPE	IG,EX,NO,AI	IG	
DATA RATE.KBPS	0.001 TO 1000000.000		250.000

zssSPRIU.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SM MG39

Device Name : MG39
 Editor Name : D0922
 Creation Date : 26 Mar 85
 Date of Last Use : 28 Mar 85
 Current Uses : 7
 Description : TEST SOFT DECISION ON FH
 zssSPRIU.DATA: RLPM: -1
 PFLAG: 7
 DULOC: 0

Display User Parameters? (Y/N): Y

Modulator Parameter Name	Option or Range	Default Value	Current Value
MODULATOR TYPE			
FREQUENCY. MHZ	0.001 TO 1000000.000		FH 7500.000
HOPPING FREQ SPACING. MHZ	0.001 TO 999.999		2.000
POWER OF 2 FOR NO OF HOP FREQ	1 TO 20		2
FREQ HOPPING RATE. MHZ	1.000000E-06 TO 9.999999E+01		1.000
LENGTH FH-PR GENERATOR	10 TO 31		10
SEED FH-PR GENERATOR	2147483647		10101
MODIFY HOP ADDRESS	YE.NO		NO
ALPHABET SIZE N-ARY FSK	2, 4, 8, 16		2
FSK TONE SPACING. KHZ	0.001 TO		

4 FA194

Device Name : FA194
 Editor Name : D0922
 Creation Date : 26 Mar 85
 Date of Last Use : 28 Mar 85
 Current User : 7
 Descriptor : TEST SOFT
 zzzzPRIV.DAT: ALPNT: -1
 PFLAG: 7
 DULOC: 0 0

Display User Parameters? (Y/N): Y

Filter Parameter Name ----- FILTER TYPE	Option or Range ----- CS,BU,BT,BE,LE, PR,PZ,FS	Default Value -----	Current Value -----
CENTER FREQUENCY, MHZ	0.001 TO 100000.000		BU 7900.000
3-DB BANDWIDTH, MHZ	0.001 TO 999.999		50.000
NO. OF POLES	1 TO 30		11

zzzzPRIV.DAT/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

SN YU14

Device Name : YU14
 Editor Name : D6922
 Creation Date : 12 Mar 85
 Date of Last Use : 22 Mar 85
 Current User :
 Description : TEST UA HARD
 EXISTING DATA: RLPT: -1
 PFLAG: 22
 DULOC: 0 0

Display User Parameters? (Y/N): Y

Decoder Parameter Name	Option or Range	Default Value	Current Value
DECODER TYPE	DF, CH, BI, SI, SB		CN
INPUT RATE	1 TO 4		2
CONSTRAINT LENGTH	2 TO 9		7
1 POLYNOMIAL COEFFICIENT 1	0, 1		1
1 POLYNOMIAL COEFFICIENT 2	0, 1		1
1 POLYNOMIAL COEFFICIENT 3	0, 1		1
1 POLYNOMIAL COEFFICIENT 4	0, 1		1
1 POLYNOMIAL COEFFICIENT 5	0, 1		0
1 POLYNOMIAL COEFFICIENT 6	0, 1		0
1 POLYNOMIAL COEFFICIENT 7	0, 1		1
2 POLYNOMIAL COEFFICIENT 1	0, 1		1
2 POLYNOMIAL COEFFICIENT 2	0, 1		0
2 POLYNOMIAL COEFFICIENT 3	0, 1		1
2 POLYNOMIAL COEFFICIENT 4	0, 1		1
2 POLYNOMIAL COEFFICIENT 5	0, 1		0
2 POLYNOMIAL COEFFICIENT 6	0, 1		1
2 POLYNOMIAL COEFFICIENT 7	0, 1		1
STATE TRANS PATH MEMORY	20 TO 60		40
INPUT SYMBOL DECISIONS	HA, SO		SO
NO. OF QUANT BITS	2 TO 5		3
QUANT THRESH SPACING	UN, UD		UN
	0.100 TO 3.000		0.500
METRIC ASSIGNMENT 1			
-METRIC 1	0.000000E+00 TO 9.999999E+37		0.000
-METRIC 2	0.000000E+00 TO 9.999999E+37		7.000
METRIC ASSIGNMENT 2			
-METRIC 1	0.000000E+00 TO 9.999999E+37		1.000
-METRIC 2	0.000000E+00 TO 9.999999E+37		0.000

-METRIC 2	0.000000E+00 TO	6.000
METRIC ASSIGNMENT 3	9.999990E+37	
-METRIC 1	0.000000E+00 TO	2.000
-METRIC 2	9.999990E+37	
METRIC ASSIGNMENT 4	0.000000E+00 TO	5.000
-METRIC 1	9.999990E+37	
-METRIC 2	0.000000E+00 TO	3.000
METRIC ASSIGNMENT 5	9.999990E+37	
-METRIC 1	0.000000E+00 TO	4.000
-METRIC 2	9.999990E+37	
METRIC ASSIGNMENT 6	0.000000E+00 TO	4.000
-METRIC 1	9.999990E+37	
-METRIC 2	0.000000E+00 TO	3.000
METRIC ASSIGNMENT 7	9.999990E+37	
-METRIC 1	0.000000E+00 TO	5.000
-METRIC 2	9.999990E+37	
METRIC ASSIGNMENT 8	0.000000E+00 TO	2.000
-METRIC 1	9.999990E+37	
-METRIC 2	0.000000E+00 TO	6.000
	9.999990E+37	
	0.000000E+00 TO	1.000
	9.999990E+37	
	0.000000E+00 TO	7.000
	9.999990E+37	
	0.000000E+00 TO	0.000
	9.999990E+37	

xxxxPRIV.DAT/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

SM ECSS

Device Name : ECSS
 Editor Name : D0922
 Creation Date : 5 Mar 85
 Date of Last Use : 28 Mar 85
 Current User : 27
 Description : TEST UA
 \$\$\$PRIU.DATA: RLPH1: -1
 PFLAG: 27
 DULOC: ● ●

Display User Parameters? (Y/N): Y

Encoder Parameter Name	Option or Range	Default Value	Current Value
ENCODER TYPE	DF, CN, BI, SI, BS		CN
INPUT RATE	1 TO 3		1
OUTPUT RATE	2 TO 4		2
CONSTRAINT LENGTH	2 TO 9		7
1 POLYNOMIAL COEFFICIENT 1	0, 1		1
1 POLYNOMIAL COEFFICIENT 2	0, 1		1
1 POLYNOMIAL COEFFICIENT 3	0, 1		1
1 POLYNOMIAL COEFFICIENT 4	0, 1		1
1 POLYNOMIAL COEFFICIENT 5	0, 1		0
1 POLYNOMIAL COEFFICIENT 6	0, 1		0
1 POLYNOMIAL COEFFICIENT 7	0, 1		1
2 POLYNOMIAL COEFFICIENT 1	0, 1		1
2 POLYNOMIAL COEFFICIENT 2	0, 1		0
2 POLYNOMIAL COEFFICIENT 3	0, 1		1
2 POLYNOMIAL COEFFICIENT 4	0, 1		1
2 POLYNOMIAL COEFFICIENT 5	0, 1		0
2 POLYNOMIAL COEFFICIENT 6	0, 1		0
2 POLYNOMIAL COEFFICIENT 7	0, 1		1

\$\$\$PRIU.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

ACCEPTANCE TEST 7C

SV18

System Name : SV18
Editor Name : FSCSS2
Creation Date : 22 Mar 85
Date of Last Run/Restart : 26 Mar 85
of Transmit Terminals : 1
of Receive Terminals : 0
of Satellites : 0
of Transmission Paths : 1

SV18 Descriptor: TEST SD OF DPSK

Exit Recv Transmission
Elem Code Path Devices
1 XT98 0 33 (None)

Display Associated Device Linkage? (Y/N): Y

Orig Device	Dest Device
1 XT98 1AB1	XT98 1AB8
2 XT98 1AB2	XT98 1AB7
3 XT98 1AB3	XT98 1AB6

xxxxPRIV.SYST: Display Simulation Status Fields? (Y/N): N

Enter FSCSS Command: SH XT98

Element Name : XT98
Editor Name : FSCSS2
Creation Date : 22 Mar 85
Date of Last Use : 22 Mar 85
Current Uses : 1
Number of Segments : 1

XT98 Descriptor: TEST SD OF DPSK.

Seg Dev
Code Count Devices
1 AB 8 GS39-EC86-MB28-FA195-ZF1-DB20-YU14-281

Enter FSCSS Command: Y

Unrecognized Command

Enter FSCSS Command:

4 GS30

Device Name : GS39
 Editor Name : D0922
 Creation Date : 26 Mar 85
 Date of Last Use : 28 Mar 85
 Current Uses : 6
 Descriptor : TEST DPSK
 3333PRIV.DATA: RLPNT: -1
 PFLAG: 6
 DULOC: 0 0

Display User Parameters? (Y/N): Y

Data Source Parameter Name	Option or Range	Default Value	Current Value
3333PRIV.TEST: SOURCE TYPE	IG,EX,AG,AI		IG
DATA RATE,KBPS	0.001 TO 100000.000		250.000

3333PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH M829

Device Name : M829
 Editor Name : D0922
 Creation Date : 26 Mar 85
 Date of Last Use : 28 Mar 85
 Current Uses : 6
 Descriptor : TEST DP SOFT
 3333PRIV.DATA: RLPNT: -1
 PFLAG: 6
 DULOC: 0 0

Display User Parameters? (Y/N): Y

Modulator Parameter Name	Option or Range	Default Value	Current Value
MODULATOR TYPE	BP,OP,OO,MS,DP, SP,16,AP,FS,CP, PH,FH,PF,CU,FH, PU		DP
FREQUENCY, MHz	0.001 TO 100000.000		8040.000

3333PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

1 FA195

Device Name : FA195
 Editor Name : D9022
 Creation Date : 28 Mar 85
 Date of Last Use : 28 Mar 85
 Current Uses : 7
 Descriptor : TEST DPSK
 \$\$\$PRIU.DATA: RLPH: -1
 PFLAG: 7
 DULOC: 0 0

Display User Parameters? (Y/N): Y

Filter Parameter Name	Option or Range	Default Value	Current Value

FILTER TYPE	CS, BU, BT, BE, LE, PR, PZ, FS		CS
CENTER FREQUENCY, MHZ	0.001 TO 100000.000		8040.000
3-DB BANDWIDTH, MHZ	0.001 TO 999.999		4.000
NO. OF POLES	1 TO 30		30
RIPPLE FACTOR, DB	0.000 TO 3.000		0.100

\$\$\$PRIU.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

SM 0020

Device Name : D020
 Editor Name : D022
 Creation Date : 26 Mar 85
 Date of Last Use : 22 Mar 85
 Current User : 6
 Description : TEST UA DSK
 \$\$\$PRIV.DAT: RLPM: -1
 PFLAG: 6
 DULOC: 0 0

Display User Parameters? (Y/N): Y

Demodulator Parameter Name	Option or Range	Default Value	Current Value
DEMODULATOR TYPE			
FREQUENCY, MHZ	BP, DP, OP, OQ, SP, 16, ES, MS, CP, AP, PN, PH, PF		DP
	100000.000		8040.000
TYPE-TIMING LOCK LOOP	DF, PU		DF
BANDWIDTH-TIMING LOCK LOOP.MZ	1000000.000		0.100
DAMPING FACTOR-TIMING LOOP	0.010 TO 0.990	0.707	0.707
AGC-TIMING LOCK LOOP	YE, NO		NO
LIMITATION AT ZERO DBU	YE, NO		NO
MINIMUM SIGNAL LEVEL, DBU	-200.000 TO 0.000		0.000
DECISION TYPE	MA, SO		SO

\$\$\$PRIV.DAT/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

3N YU14

Device Name : YU14
 Editor Name : D4922
 Creation Date : 12 Mar 85
 Date of Last Use : 22 Mar 85
 Current User : 22
 Descriptor : TEST UA HARD
 333PRU.DAT: RLPT: -1
 PFLAG: 22
 DULOC: 0 0

Display User Parameters? (Y/N): Y

Decoder Parameter Name	Option or Range	Default Value	Current Value
DECODE TYPE	DF,CN,BI,SI,SB		CN
INPUT RATE	2 TO 4		2
OUTPUT RATE	1 TO 3		1
CONSTRAINT LENGTH	2 TO 9		7
1 POLYNOMIAL COEFFICIENT 1	0.		1
1 POLYNOMIAL COEFFICIENT 2	0.		1
1 POLYNOMIAL COEFFICIENT 3	0.		1
1 POLYNOMIAL COEFFICIENT 4	0.		1
1 POLYNOMIAL COEFFICIENT 5	0.		0
1 POLYNOMIAL COEFFICIENT 6	0.		0
1 POLYNOMIAL COEFFICIENT 7	0.		1
2 POLYNOMIAL COEFFICIENT 1	0.		1
2 POLYNOMIAL COEFFICIENT 2	0.		0
2 POLYNOMIAL COEFFICIENT 3	0.		1
2 POLYNOMIAL COEFFICIENT 4	0.		1
2 POLYNOMIAL COEFFICIENT 5	0.		0
2 POLYNOMIAL COEFFICIENT 6	0.		1
2 POLYNOMIAL COEFFICIENT 7	0.		1
STATE TRANS PATH MEMORY	20 TO 60		40
INPUT SYMBOL DECISIONS	HA,SO		50
NO. OF QUANT BITS	UN,UD		UN
QUANT THRESH SPACING	0.100 TO 3.000		0.500
METRIC ASSIGNMENT 1	0.000000E+00 TO 9.999999E+37		0.000
-METRIC 1	0.000000E+00 TO 9.999999E+37		7.000
-METRIC 2	0.000000E+00 TO 9.999999E+37		1.000
METRIC ASSIGNMENT 2	0.000000E+00 TO 9.999999E+37		
-METRIC 1			
-METRIC 2			

-METRIC 2	0.000000E+00 TO	6.000
METRIC ASSIGNMENT 3	9.999990E+37	
-METRIC 1	0.000000E+00 TO	2.000
-METRIC 2	9.999990E+37	5.000
METRIC ASSIGNMENT 4	0.000000E+00 TO	3.000
-METRIC 1	9.999990E+37	4.000
-METRIC 2	0.000000E+00 TO	4.000
METRIC ASSIGNMENT 5	9.999990E+37	3.000
-METRIC 1	0.000000E+00 TO	
-METRIC 2	9.999990E+37	5.000
METRIC ASSIGNMENT 6	0.000000E+00 TO	2.000
-METRIC 1	9.999990E+37	
-METRIC 2	0.000000E+00 TO	6.000
METRIC ASSIGNMENT 7	9.999990E+37	1.000
-METRIC 1	0.000000E+00 TO	
-METRIC 2	9.999990E+37	7.000
METRIC ASSIGNMENT 8	0.000000E+00 TO	0.000
-METRIC 1	9.999990E+37	
-METRIC 2	0.000000E+00 TO	

####PRIV.DATA/TEST: DISPLAY ALL FIELD57 (Y/N): N

Enter FSCS Command:

SN EC86

Device Name : EC86
 Editor Name : D0922
 Creation Date : 5 Mar 85
 Date of Last Use : 28 Mar 85
 Current Uses : 27
 Descriptor : TEST UA
 \$\$\$PRIV.DATA: RLPNT: -1
 PFLAG: 27
 DULOC: 0 0

Display User Parameters? (Y/N): Y

Encoder Parameter Name	Option or Range	Default Value	Current Value
ENCODER TYPE	DF, CN, BI, SI, BS		CN
INPUT RATE	1 TO 3		1
OUTPUT RATE	2 TO 4		2
CONSTRAINT LENGTH	2 TO 9		7
1 POLYNOMIAL COEFFICIENT 1	0		1
1 POLYNOMIAL COEFFICIENT 2	0		1
1 POLYNOMIAL COEFFICIENT 3	0		1
1 POLYNOMIAL COEFFICIENT 4	0		1
1 POLYNOMIAL COEFFICIENT 5	0		0
1 POLYNOMIAL COEFFICIENT 6	0		0
1 POLYNOMIAL COEFFICIENT 7	0		1
2 POLYNOMIAL COEFFICIENT 1	0		1
2 POLYNOMIAL COEFFICIENT 2	0		0
2 POLYNOMIAL COEFFICIENT 3	0		1
2 POLYNOMIAL COEFFICIENT 4	0		1
2 POLYNOMIAL COEFFICIENT 5	0		0
2 POLYNOMIAL COEFFICIENT 6	0		1
2 POLYNOMIAL COEFFICIENT 7	0		1

\$\$\$PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

ACCEPTANCE TEST 7D

8-FSK SYMBOL INPUT SOFT DECISION DECODING

XT25



SH XT25

Element Name : XT25
Editor Name : D0279
Creation Date : 16 Mar 85
Date of Last Use : 16 Mar 85
Current Uses : 1
Number of Segments : 1
xxxxPRIU.DAT: RLPT: -1 PFLAG: 1
Latitude : 0 Deg 0 Min N
Longitude : 0 Deg 0 Min E
Altitude : 0.000 Kilometers

XT25 Descriptor: UIT SO. TEST, 8-FSK SVNB

Sag Dev
Code Count Devices
1 AB 10 GS95-EC63-E558-MD143-2F1-LM1-DD14-VSB3-YVB-ZB1

Enter FSCSS Command: SH GS95

Device Name : GS95
Editor Name : D0279
Creation Date : 28 Jan 85
Date of Last Use : 2 Apr 85
Current Uses : 33
Descriptor : 2.4 KBPS FOR SYNCH INTER
xxxxPRIU.DAT: RLPT: -1
PFLAG: 33
DULOC: 0 0

Display User Parameters? (Y/N): Y

Date Source Parameter Name	Option or Range	Default Value	Current Value
xxxxPRIU.TEST: SOURCE TYPE	IG,EX,A0,A1		IG
DATA RATE,KBPS	0.001 TO 100000.000		2.400

xxxxPRIU.DAT/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

SM EC63

Device Name : EC63
 Editor Name : D0279
 Creation Date : 22 Feb 85
 Date of Last Use : 26 Mar 85
 Current Uses : 11
 Description : UUT R-1/2, LEN-7 CODER
 \$\$\$PRIV.DATA: RLPM: -1
 PFLAG: 11
 DULOC: 0 0

Display User Parameters? (Y/N): Y

Encoder Parameter Name	Option or Range	Default Value	Current Value
ENCODER TYPE	DF, CN, B1, S1, B5		CM
INPUT RATE	1 TO 3		1
OUTPUT RATE	2 TO 4		2
CONSTRAINT LENGTH	2 TO 9		7
1 POLYNOMIAL COEFFICIENT 1	0.		1
1 POLYNOMIAL COEFFICIENT 2	0.		1
1 POLYNOMIAL COEFFICIENT 3	0.		1
1 POLYNOMIAL COEFFICIENT 4	0.		1
1 POLYNOMIAL COEFFICIENT 5	0.		0
1 POLYNOMIAL COEFFICIENT 6	0.		0
1 POLYNOMIAL COEFFICIENT 7	0.		1
2 POLYNOMIAL COEFFICIENT 1	0.		1
2 POLYNOMIAL COEFFICIENT 2	0.		0
2 POLYNOMIAL COEFFICIENT 3	0.		1
2 POLYNOMIAL COEFFICIENT 4	0.		1
2 POLYNOMIAL COEFFICIENT 5	0.		0
2 POLYNOMIAL COEFFICIENT 6	0.		0
2 POLYNOMIAL COEFFICIENT 7	0.		1

\$\$\$PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Commands:

SH ESSB

Device Name : ESSB
Editor Name : D0279
Creation Date : 16 Mar 85
Date of Last Use : 16 Mar 85
Current Uses : 1
Descriptor : 8-BIT-TO-SYMBOL CONV
xxxxPRIU.DAT: RLPT: -1
PFLAG: 1
DULOC: 0

Display User Parameters? (Y/N): N

xxxxPRIU.DAT/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH MD143

Device Name : MD143
Editor Name : D0279
Creation Date : 28 Mar 85
Date of Last Use : 2 Apr 85
Current Uses : 23
Descriptor : 8-FSK SYMBOL INPUT
xxxxPRIU.DAT: RLPT: -1
PFLAG: 23
DULOC: 0

Display User Parameters? (Y/N): Y

Modulator
Parameter Name

MODULATOR TYPE

FREQUENCY, MHZ

ALPHABET SIZE

FREQUENCY SPACING, KHZ

INPUT SYMBOL TYPE

xxxxPRIU.DAT/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

	Option or Range	Default Value	Current Value
	BP, QP, 00, MS, DP, SP, 16, AP, FS, CP, PM, FH, PF, CU, FN, PU		FS
	0.001 TO 100000.000		70.000
	2, 8, 16		8
	0.001 TO 9999.999		35.000
	BI, SY		SV

****PRIU.DATA/TEST: DISPLAY ALL FIELDS? (Y/N):

4 8014

Device Name : 8014
Editor Name : D0279
Creation Date : 22 Mar 85
Date of Last Use : 18 Mar 85
Current Uses : 3
Description : 8-FSK SOFT DECS.
****PRIU.DATA: RLPNT: -1
PFLAG: 3
DULOC: 0

Display User Parameters? (Y/N): Y

Demodulator

Parameter Name

DEMODULATOR TYPE

Option or Range

BP,DP,OP,QQ,SP,
16,FS,MS,CP,AP,
PN,FH,PF

Default Value

Current Value

FS

FREQUENCY, MHZ

0.001 TO
100000.000

70.000

ALPHABET SIZE

2, 4,
8, 16

8

FREQUENCY SPACING, KHZ

0.001 TO
9999.999

35.000

BANDWIDTH-TIMING LOCK LOOP, HZ

0.000 TO
100000.000

0.000

DAMPING FACTOR-TIMING LOOP

0.010 TO
9.990

0.707

AGC-TIMING LOCK LOOP

VE,NO

NO

LIMITATION AT ZERO DBU

VE,NO

VE

DECISION TYPE

MA,SO

SO

****PRIU.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SM Y583

Device Name : Y583
Editor Name : D0279
Creation Date : 16 Mar 85
Date of Last Use : 16 Mar 85
Current Uses : 2
Description : 8-FSK SO. SYN-TO-BIT
****PRIU.DATA: RLPNT: -1
PFLAG: 2
DULOC: 0

Display User Parameters? (Y/N): Y

Decoder

Parameter Name

DECODER TYPE

INPUT SYMBOL TYPE

ALPHABET SIZE

INPUT SYMBOL DECISIONS

Option or Range

DE,CH,BI,S1,S8
FS,FH,SP,16

Default Value

Current Value

S8

FS

SO

3M VU8

Device Name : YU8
 Editor Name : D9279
 Creation Date : 22 Mar 85
 Date of Last Use : 26 Mar 85
 Current User : 4
 Descriptor : R - 1/2, LEN=7, UD, SOFT
 *****DATA: RLPT: -1
 PFLAG: 4
 DULOC: 0 0

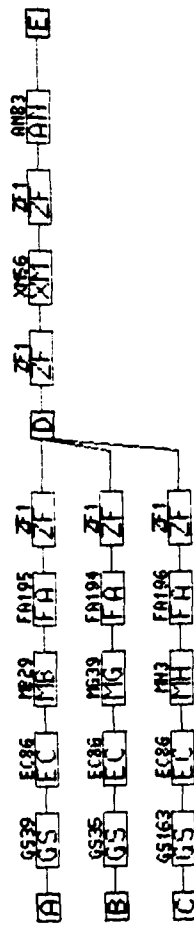
Display User Parameters? (Y/N): Y

Decoder Parameter Name	Option or Range	Default Value	Current Value
-----	-----	-----	-----
DECODER TYPE	DF, CN, BL, SL, SB		CM
INPUT RATE	2 TO 4		2
OUTPUT RATE	1 TO 3		1
CONSTRAINT LENGTH	2 TO 9		7
1 POLYNOMIAL COEFFICIENT 1	0, 1		1
1 POLYNOMIAL COEFFICIENT 2	0, 1		1
1 POLYNOMIAL COEFFICIENT 3	0, 1		1
1 POLYNOMIAL COEFFICIENT 4	0, 1		1
1 POLYNOMIAL COEFFICIENT 5	0, 1		0
1 POLYNOMIAL COEFFICIENT 6	0, 1		0
1 POLYNOMIAL COEFFICIENT 7	0, 1		1
2 POLYNOMIAL COEFFICIENT 1	0, 1		1
2 POLYNOMIAL COEFFICIENT 2	0, 1		0
2 POLYNOMIAL COEFFICIENT 3	0, 1		1
2 POLYNOMIAL COEFFICIENT 4	0, 1		1
2 POLYNOMIAL COEFFICIENT 5	0, 1		0
2 POLYNOMIAL COEFFICIENT 6	0, 1		1
2 POLYNOMIAL COEFFICIENT 7	0, 1		1
STATE TRANS PATH MEMORY	20 TO 60		40
INPUT SYMBOL DECISIONS	MA, SO		SO
NO. OF QUANT BITS	2 TO 5		3
QUANT THRESH SPACING SPEC	UM, UD		UM
QUANT THRESH SPACING	0.100 TO 3.000		0.400
METRIC ASSIGNMENT 1			
-METRIC 1	0.000000E+00 TO 9.999999E+37		0.000
-METRIC 2	0.000000E+00 TO 9.999999E+37		7.000
METRIC ASSIGNMENT 2			
-METRIC 1	0.000000E+00 TO 9.999999E+37		1.000
-METRIC 2	0.000000E+00 TO 9.999999E+37		6.000
METRIC ASSIGNMENT 3			
-METRIC 1			

Enter FSCSS Command:

ACCEPTANCE TEST 8

TEST 7
XT63

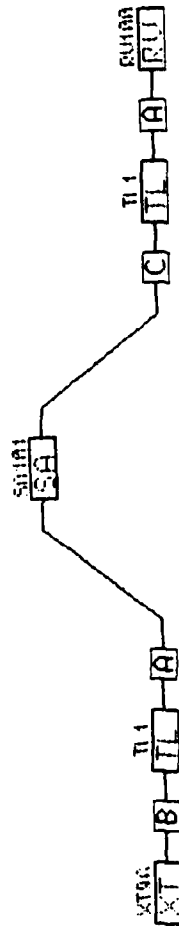


XT63 Generate Stored Samples

TEST 7/8 WITH KS
SA90



ACCEPTANCE TEST 8
SY30

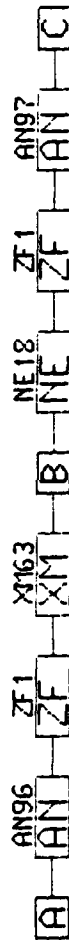


TEST MSK SOFT
XT96



TEST8 PLAYBACK

SA101



RV FOR AT8
RV100



Enter FSCSS Command:

Enter FSCSS Command: SH SV12

System Name : SV12
 Editor Name : FSC552
 Creation Date : 26 Apr 85
 Date of Last Run/Restart : 26 Apr 85
 # of Transmit Terminals : 1
 # of Receive Terminals : 0
 # of Satellites : 1
 # of Transmission Paths : 1

SV12 Descriptor: AT7 WITH KS.

Xmit Recv Transmission
 # Elem Elem Code Path Devices
 1 XT63 SA90 EA TL1

Display Associated Device Linkage? (Y/N): Y
 No Associated Devices

xxxxPRIU.SYST: Display Simulation Status Fields? (Y/N): N

Enter FSCSS Command: SH XT63

Element Name : XT63
 Editor Name : FSC552
 Creation Date : 20 Mar 85
 Date of Last Use : 26 Apr 85
 Current Uses : 6
 Number of Segments : 4

XT63 Descriptor: TEST 7

#	Seg	Dev	Count	Devices
1	AD	5		GS39-EC86-MB28-FA195-ZF1
2	BD	5		GS35-EC86-MC39-FA194-ZF1
3	CD	5		GS163-EC86-MH3-FA196-ZF1
4	DE	4		ZF1-XT56-ZF1-AM83

Enter FSCSS Command: SH SA90

Element Name : SA90
 Editor Name : FSC552
 Creation Date : 22 Mar 85
 Date of Last Use : 26 Apr 85
 Current Uses : 4
 Number of Segments : 2

SA90 Descriptor: TEST 7/8 WITH KS

#	Seg	Dev	Count	Devices
1	AB	3		AM86-ZF1-XT63
2	BC	3		KS26-ZF1-AM87

Enter Entity Name: GS39

Device Name : GS39
Editor Name : D0922
Creation Date : 26 Mar 85
Date of Last Use : 28 Mar 85
Current Uses : 6
Descriptor : TEST DPSK
xxxxPRIV.DATA: RLPT: -1
PFLAG: 6
DULOC: 0

Display User Parameters? (Y/N): Y

Data Source Parameter Name	Option or Range	Default Value	Current Value
xxxxPRIV.TEST: SOURCE TYPE	IG,EX,A0,A1		IG
DATA RATE,KBPS	0.001 TO 1000000.000		250.000

xxxxPRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SM GS35

Device Name : GS35
Editor Name : D0922
Creation Date : 26 Mar 85
Date of Last Use : 28 Mar 85
Current Uses : 7
Descriptor : TEST
xxxxPRIV.DATA: RLPT: -1
PFLAG: 7
DULOC: 0

Display User Parameters? (Y/N): Y

Data Source Parameter Name	Option or Range	Default Value	Current Value
xxxxPRIV.TEST: SOURCE TYPE	IG,EX,A0,A1		IG
DATA RATE,KBPS	0.001 TO 1000000.000		250.000

xxxxPRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

Enter FSC99 Command: SH GS163

Device Name : GS163
Editor Name : D0522
Creation Date : 26 Mar 85
Date of Last Use : 28 Mar 85
Current Uses : 9
Description : TEST PN/FM SOFT
xxxxPRIV.DAT: RLNT: -1
PFLAG: 9
DULOC: 0 0

Display User Parameters? (Y/N): Y

Data Source Parameter Name	Option or Range	Default Value	Current Value
xxxxPRIV.TEST: SOURCE TYPE	IG,EX,AG,AI		IG
DATA RATE,KBPS	0.001 TO 1000000.000		250.000

xxxxPRIV.DAT/TEST: DISPLAY ALL FIELDS? (Y/N):

SN EC86

Device Name : EC86
 Editor Name : D0522
 Creation Date : 5 Mar 85
 Date of Last Use : 28 Mar 85
 Current User : 27
 Description : TEST UA
 \$\$\$PRIV.DATA: RLPMNT: -1
 PFLAG: 27
 DULOC: 0 0

Display User Parameters? (Y/N): Y

Encoder Parameter Name	Option or Range	Default Value	Current Value
-----	-----	-----	-----
ENCODER TYPE	DF, CN, B1, S1, B5		CN
INPUT RATE	1 TO 3		1
OUTPUT RATE	2 TO 4		2
CONSTRAINT LENGTH	2 TO 9		7
1 POLYNOMIAL COEFFICIENT 1	0.		1
1 POLYNOMIAL COEFFICIENT 2	0.		1
1 POLYNOMIAL COEFFICIENT 3	0.		1
1 POLYNOMIAL COEFFICIENT 4	0.		1
1 POLYNOMIAL COEFFICIENT 5	0.		0
1 POLYNOMIAL COEFFICIENT 6	0.		0
1 POLYNOMIAL COEFFICIENT 7	0.		1
2 POLYNOMIAL COEFFICIENT 1	0.		1
2 POLYNOMIAL COEFFICIENT 2	0.		0
2 POLYNOMIAL COEFFICIENT 3	0.		1
2 POLYNOMIAL COEFFICIENT 4	0.		1
2 POLYNOMIAL COEFFICIENT 5	0.		0
2 POLYNOMIAL COEFFICIENT 6	0.		1
2 POLYNOMIAL COEFFICIENT 7	0.		1

\$\$\$PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

SN MB29

Device Name : MB29
Editor Name : D0922
Creation Date : 26 Mar 85
Date of Last Use : 28 Mar 85
Current Uses : 6
Descriptor : TEST DP SOFT
xxxxPRIU.DAT: RLPM: -1
PFLAG: 6
DULOC: 0 0

Display User Parameters? (Y/N): Y

Modulator
Parameter Name

MODULATOR TYPE

Option or Range Default Value Current Value

BP, QP, OQ, MS, DP,
SP, 16, AP, FS, CP,
PN, FM, PF, CU, FH,
PU

0.001 TO
100000.000

DP

8040.000

FREQUENCY, MHZ

xxxxPRIU.DAT/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

SM NC39

Device Name : MG39
 Editor Name : D922
 Creation Date : 26 Mar 85
 Date of Last Use : 28 Mar 85
 Current Uses : 7
 Descriptor : TEST SOFT DECISION ON FH
 #####PRIU.DAT: RLPT: -1
 PFLAG: 7
 DULOC: 0 0

Display User Parameters? (Y/N): Y

Modulator Parameter Name	Option or Range	Default Value	Current Value

MODULATOR TYPE			
FREQUENCY, MHZ	0.001 TO 100000.000		FH 7500.000
HOPPING FREQ SPACING, MHZ	0.001 TO 999.999		2.000
POWER OF 2 FOR NO OF HOP FREQ FREQ HOPPING RATE, MHZ	1 TO 20 1.000000E-06 TO 9.999999E+01		2 1.000 10
LENGTH FH-PR GENERATOR SEED FH-PR GENERATOR	1 TO 31 10 TO 1 TO 2147483647	10	10101
MODIFY HOP ADDRESS ALPHABET SIZE N-ARY FSK	VE,NO 2, 4, 8, 16, 0.001 TO 9999.999		NO 2
FSK TONE SPACING, KHZ			500.000
INPUT SYMBOL TYPE	BI,SY		SV

#####PRIU.DAT/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

Enter FSCSS Command: SH MM3

Device Name : MM3
 Editor Name : D0922
 Creation Date : 26 Mar 85
 Date of Last Use : 28 Mar 85
 Current User : 9
 Descriptor : TEST SOFT DECISION
 #####PRIV.DATA: RLPMT: -1
 PFLAG: 9
 DULOC: 0 0

Display User Parameters? (Y/N): Y

Modulator Parameter Name	Option or Range	Default Value	Current Value

MODULATOR TYPE			

FREQUENCY, MHZ	0.001 TO 100000.000		PF 8000.000
CHIP RATE, MHZ	0.001 TO 999.999		5.000
LENGTH IN-PHASE GEN	10 TO 31		31
LENGTH QUAD GEN	10 TO 31		31
SEED IN-PHASE GEN	1 TO 2147483647		101010101
SEED QUAD GEN	1 TO 2147483647		101010101
HOPPING FREQ SPACING, MHZ	0.001 TO 999.999		5.000
POWER OF 2 FOR NO OF HOP FREQ	1 TO 20		2
FREQ HOPPING RATE, MHZ	1.000000E-06 TO 9.999900E+01		1.000
LENGTH FH-PR GENERATOR	10 TO 31	10	10
SEED FH-PR GENERATOR	1 TO 2147483647		101010101
MODIFY HOP ADDRESS	YE,NO		NO

#####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

Enter FSCSS Command: SH FA194

Device Name : FA194
 Editor Name : D0922
 Creation Date : 26 Apr 85
 Date of Last Use : 28 Mar 85
 Current Uses : 7
 Descriptor : TEST SOFT
 #####PRIV.DATA: ALPNT: -1
 PFLAG: 7
 DULOC: 0 0

Display User Parameters? (Y/N): Y

Filter Parameter Name	Option or Range	Default Value	Current Value

FILTER TYPE	CS,BU,BT,BE,LE, PR,PZ,FS		BU
CENTER FREQUENCY, MHZ	0.001 TO 100000.000		7800.000
3-DB BANDWIDTH, MHZ	0.001 TO 999.999		40.000
NO. OF POLES	1 TO 30		11

#####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH FA195

Device Name : FA195
 Editor Name : D0922
 Creation Date : 28 Mar 85
 Date of Last Use : 28 Mar 85
 Current Uses : 7
 Descriptor : TEST DPSK
 #####PRIV.DATA: ALPNT: -1
 PFLAG: 7
 DULOC: 0 0

Display User Parameters? (Y/N): Y

Filter Parameter Name	Option or Range	Default Value	Current Value

FILTER TYPE	CS,BU,BT,BE,LE, PR,PZ,FS		CS
CENTER FREQUENCY, MHZ	0.001 TO 100000.000		8040.000
3-DB BANDWIDTH, MHZ	0.001 TO 999.999		4.000
NO. OF POLES	1 TO 30		30
RIPPLE FACTOR, DB	0.000 TO 3.000		0.100

#####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N):

Enter FSCSS Command: SH FA196

Device Name : FA196
 Editor Name : D0922
 Creation Date : 26 Apr 85
 Date of Last Use : 28 Mar 85
 Current Uses : 8
 Descriptor : TEST PH/FM SOFT
 RLPNT: -1
 PFLAG: 8
 DULOC: 0 0

Display User Parameters? (Y/N): Y

Filter Parameter Name	Option or Range	Default Value	Current Value
FILTER TYPE	CS,BU,BT,BE,LE, PR,PZ,FS		BU
CENTER FREQUENCY, MHZ	0.001 TO 100000.000		8000.000
3-DB BANDWIDTH, MHZ	0.001 TO 999.999		25.000
NO. OF POLES	1 TO 30		11

xxxxPRIU.DAT/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

SH XMS6

Device Name : XMS6
Editor Name : D0922
Creation Date : 14 Mar 85
Date of Last Use : 28 Mar 85
Current Uses : 5
Descriptor :
xxxxPRIU.DATA: RLPNT: -1
PFLAG: 5
DULOC: 0 0

Display User Parameters? (Y/N): Y

Amplifier Parameter Name	Option or Range	Default Value	Current Value
GAIN, DB	-200.000 TO 200.000		48.110

xxxxPRIU.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH AN83

Device Name : AN83
Editor Name : D0922
Creation Date : 12 Mar 85
Date of Last Use : 28 Mar 85
Current Uses : 5
Descriptor : AT
xxxxPRIU.DATA: RLPNT: -1
PFLAG: 5
DULOC: 0 0

Display User Parameters? (Y/N): Y

Antenna Parameter Name	Option or Range	Default Value	Current Value
APPLICATION ANTENNA TYPE	SU, SD, EX, ER, SS AG, EC, NB, PN, SN, BN		EX AG
ANTENNA GAIN, DB	-99.900 TO 99.900		60.000

xxxxPRIU.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

SH AM96

Device Name : AM96
Editor Name : D0322
Creation Date : 14 Mar 85
Date of Last Use : 26 Mar 85
Current Uses : 6
Descriptor : TEST 7,8
xxxxPRIU.DATA: RLPNT: -1
PFLAG: 6
DULOC: 0 0

Display User Parameters? (Y/N): Y

Antenna Parameter Name	Option or Range	Default Value	Current Value
APPLICATION	SU,SD,EX,ER,SS		SU
ANTENNA TYPE	AG,EC,NB,PN,SN, BN,PA,SA,SA		AG
ANTENNA GAIN, DB	-99.900 TO 99.900		90.000

xxxxPRIU.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH XM63

Device Name : XM63
Editor Name : D0522
Creation Date : 22 Mar 85
Date of Last Use : 26 Mar 85
Current Uses : 6
Descriptor : TEST 7,8 SA
xxxxPRIU.DATA: RLPNT: -1
PFLAG: 6
DULOC: 0 0

Display User Parameters? (Y/N): Y

Amplifier Parameter Name	Option or Range	Default Value	Current Value
GAIN, DB	-200.000 TO 200.000		-6.300

xxxxPRIU.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

SH K980

Device Name : KS20
Editor Name : FSCSS2
Creation Date : 22 Mar 85
Date of Last Use : 22 Mar 85
Current Uses : 1
Descriptor : TEST 7 SAMPLES
xxxxPRIV.DATA: RLPT: -1
PFLAG: 1
DULOC: 0 0

Display User Parameters? (Y/N): Y

Keep Samples Parameter Name	Option or Range	Default Value	Current Value
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EXTERNAL KEEP SAMPLES FILENAME --
CURRENT VALUE: TEST7

xxxxPRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH AN97

Device Name : AN97
Editor Name : D0922
Creation Date : 14 Mar 85
Date of Last Use : 26 Mar 85
Current Uses : 6
Descriptor : TEST 7,8
xxxxPRIV.DATA: RLPT: -1
PFLAG: 6
DULOC: 0 0

Display User Parameters? (Y/N): Y

Antenna Parameter Name	Option or Range	Default Value	Current Value
APPLICATION	SU, SD, EX, ER, SS		SD
ANTENNA TYPE	AG, EG, MB, PN, SN, BN		AG
ANTENNA GAIN, DB	-99.900 TO 99.900		99.000

xxxxPRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

Enter FSCSS Command: SH SY30

System Name : SY30
 Editor Name : FSCSS2
 Creation Date : 22 Mar 85
 Date of Last Run/Restart : 26 Apr 85
 # of Transmit Terminals : 1
 # of Receive Terminals : 1
 # of Satellites : 1
 # of Transmission Paths : 2

xxxxPRIV.DAT: RLPNT: -1 PFLAG: 7
 STPTR: 493

Linkage Specification : GE
 TDMA Devices : (None)
 Demand Access "Devices" : (None)

SY30 Descriptor: ACCEPT TEST 8

Xmit	Recv	Code	Transmission Path Devices
1	XT96	SA101	BA TL1
2	SA101	RU100	CA TL1

Display Associated Device Linkage? (Y/N): Y

Orig	Device	Dest	Device
1	XT96	1AB1	RU100
2	XT96	1AB2	RU100
3	XT96	1AB3	RU100

xxxxPRIV.SYST: Display Simulation Status Fields? (Y/N): N

Enter FSCSS Command: SH XT96
 Element Does Not Exist: XT96

Enter FSCSS Command: SH XT96

Element Name : XT96
 Editor Name : FSCSS2
 Creation Date : 22 Mar 85
 Date of Last Use : 22 Mar 85
 Current Uses : 1
 Number of Segments : 1

xxxxPRIV.DAT: RLPNT: -1 PFLAG: 1

Latitude : 0 Deg 0 Min N
 Longitude : 0 Deg 0 Min E
 Altitude : 0.000 Kilometers

XT96 Descriptor: TEST MSK SOFT

Seg	Dev	Count	Devices
1	AB	7	GS157-EC86-MA114-ZF1-FA385-ZF1-MK38

Enter FSCSS Command:

4 SA101

Element Name : SA101
Editor Name : FSC552
Creation Date : 22 Mar 85
Date of Last Use : 22 Mar 85
Current Uses : 1
Number of Segments : 2

SA101 Descriptor: TEST8 PLAY BACK.

#	Code	Count	Dev	Devices
1	AB	3		AN96-2F1-XM63
2	BC	3		ME18-2F1-AN97

Enter FSCSS Command: SH RU100

Element Name : RU100
Editor Name : FSC552
Creation Date : 22 Mar 85
Date of Last Use : 22 Mar 85
Current Uses : 1
Number of Segments : 1

RU100 Descriptor: RU FOR AT8

#	Code	Count	Dev	Devices
1	AB	8		AN84-XM220-2F1-FA385-2F1-DA79-VU14-ZB1

Enter FSCSS Command:

xxxxPRIV.DAT: RLPNT: -1 PFLAG: 1
Latitude : 0 Deg 0 Min N
Longitude : 0 Deg 0 Min E
Altitude : 35860.000 Kilometers

xxxxPRIV.DAT: RLPNT: -1 PFLAG: 1
Latitude : 0 Deg 0 Min N
Longitude : 0 Deg 0 Min E
Altitude : 0.000 Kilometers

Enter FSCSS Command: SH GS157

Device Name : GS157
Editor Name : FSC552
Creation Date : 26 Mar 85
Date of Last Use : 22 Mar 85
Current Uses : 1
Descriptor :
#####DATA: RLPNT: -1
PFLAG: 1
DULOC: 0 0

Display User Parameters? (Y/N): Y

Data Source Parameter Name	Option or Range	Default Value	Current Value
#####TEST: SOURCE TYPE	IG,EX,AG,AI		IG
DATA RATE,KBPS	0.001 TO 1000000.000		250.000

#####DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH MA114

Device Name : MA114
Editor Name : FSC552
Creation Date : 26 Mar 85
Date of Last Use : 22 Mar 85
Current Uses : 1
Descriptor :
#####DATA: RLPNT: -1
PFLAG: 1
DULOC: 0 0

Display User Parameters? (Y/N): Y

Modulator Parameter Name	Option or Range	Default Value	Current Value
MODULATOR TYPE	BP,GP,QQ,MS,DP, SP,16,AP,ES,CP, PH,FH,PF,CW,FH, PU		MS
FREQUENCY, MHz	0.001 TO 100000.000		7950.000

#####DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

SM EC86

Device Name : EC86
 Editor Name : D0922
 Creation Date : 5 Mar 85
 Date of Last Use : 28 Mar 85
 Current Uses : 27
 Descriptor : TEST UA
 \$\$\$PRIV.DATA: RLPNT: -1
 PFLAG: 27
 DULOC: 0 0

Display User Parameters? (Y/N): Y

Encoder Parameter Name	Option or Range	Default Value	Current Value
ENCODER TYPE	DF,CN,B1,S1,BS		CN
INPUT RATE	1 TO 3		1
OUTPUT RATE	2 TO 4		2
CONSTRAINT LENGTH	2 TO 9		7
1 POLYNOMIAL COEFFICIENT 1	0.		1
1 POLYNOMIAL COEFFICIENT 2	0.		1
1 POLYNOMIAL COEFFICIENT 3	0.		1
1 POLYNOMIAL COEFFICIENT 4	0.		1
1 POLYNOMIAL COEFFICIENT 5	0.		0
1 POLYNOMIAL COEFFICIENT 6	0.		0
1 POLYNOMIAL COEFFICIENT 7	0.		1
2 POLYNOMIAL COEFFICIENT 1	0.		1
2 POLYNOMIAL COEFFICIENT 2	0.		0
2 POLYNOMIAL COEFFICIENT 3	0.		1
2 POLYNOMIAL COEFFICIENT 4	0.		1
2 POLYNOMIAL COEFFICIENT 5	0.		0
2 POLYNOMIAL COEFFICIENT 6	0.		1
2 POLYNOMIAL COEFFICIENT 7	0.		1

\$\$\$PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

SM FA385

Device Name : FA385
 Editor Name : FSCS2
 Creation Date : 26 Mar 85
 Date of Last Use : 22 Mar 85
 Current Uses : 2
 Descriptor :
 xxxpriu.data: RLPNT: -1
 PFLAG: 2
 DULOC: 0

Display User Parameters? (Y/N): Y

Filter Parameter Name	Option or Range	Default Value	Current Value
FILTER TYPE	CS,BU,BT,BE,LE, PR,PZ,FS		CS
CENTER FREQUENCY, MHZ	0.001 TO 100000.000		7950.000
3-DB BANDWIDTH, MHZ	0.001 TO 999.999		2.000
NO. OF POLES	1 TO 30		11
RIPPLE FACTOR, DB	0.000 TO 3.000		0.100

xxxxpriu.data/test: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCS Command: SM AN38

Device Name : AN38
 Editor Name : FSCS2
 Creation Date : 22 Mar 85
 Date of Last Use : 22 Mar 85
 Current Uses : 1
 Descriptor :
 xxxpriu.data: RLPNT: -1
 PFLAG: 1
 DULOC: 0

Display User Parameters? (Y/N): Y

Antenna Parameter Name	Option or Range	Default Value	Current Value
APPLICATION ANTENNA TYPE	SU,SD,EX,ER,SS AG,EC,NB,PN,SN, BN		EX
ANTENNA GAIN, DB	-99.999 TO 99.999		AG 90.000

xxxxpriu.data/test: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCS Command:

SH AM96

Device Name : AM96
Editor Name : D0922
Creation Date : 14 Mar 85
Date of Last Use : 26 Mar 85
Current Uses : 6
Descriptor : TEST 7.8
xxxxPRU.DATA: RLPT: -1
PFLAG: 6
DULOC: 0 0

Display User Parameters? (Y/N): Y

Antenna Parameter Name	Option or Range	Default Value	Current Value
APPLICATION	SU,SD,EX,ER,SS		SU
ANTENNA TYPE	AG,EC,NB,PN,SN, BN,PA,SA,BA		AG
ANTENNA GAIN, DB	-99.900 TO 99.900		90.000

xxxxPRU.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH XM63

Device Name : XM63
Editor Name : D0922
Creation Date : 22 Mar 85
Date of Last Use : 26 Mar 85
Current Uses : 6
Descriptor : TEST 7.8 SA
xxxxPRU.DATA: RLPT: -1
PFLAG: 6
DULOC: 0 0

Display User Parameters? (Y/N): Y

Amplifier Parameter Name	Option or Range	Default Value	Current Value
GAIN, DB	-200.000 TO 200.000		-6.300

xxxxPRU.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

Enter FSCSS Command: SH ME18

Device Name : ME18
Editor Name : FSCSS2
Creation Date : 22 Mar 85
Date of Last Use : 26 Mar 85
Current Uses : 3
Descriptor : TEST 8 PLAY SAMPS.
xxxxPRIU.DAT: RLPNT: -1
PFLAG: 3
DULOC: 0 0

Display User Parameters? (Y/N): Y

Noise Source Parameter Name	Option or Range	Default Value	Current Value
TYPE OF NOISE	TE, SA	TE	SA

EXTERNAL SAMPLE SOURCE FILENAME --
CURRENT VALUE: TEST7

xxxxPRIU.DAT/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH AN97

Device Name : AN97
Editor Name : D0922
Creation Date : 14 Mar 85
Date of Last Use : 26 Mar 85
Current Uses : 6
Descriptor : TEST 7.8
xxxxPRIU.DAT: RLPNT: -1
PFLAG: 6
DULOC: 0 0

Display User Parameters? (Y/N): Y

Antenna Parameter Name	Option or Range	Default Value	Current Value
APPLICATION	SU, SD, EX, ER, SS		SD
ANTENNA TYPE	AG, EC, NB, PM, SM, BM		AG
ANTENNA GAIN, DB	-99.900 TO 99.900		90.000

xxxxPRIU.DAT/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

SN AN84

Device Name : AN84
Editor Name : FS:SS2
Creation Date : 22 Mar 85
Date of Last Use : 22 Mar 85
Current Uses : 1
Descriptor : AT 8 MSK
#####PRIV.DATA: RLPM: -1
PFLAG: 1
DULOC: 0 0

Display User Parameters? (Y/N): Y

Antenna Parameter Name	Option or Range	Default Value	Current Value
APPLICATION	SU,SD,EX,ER,SS		ER
ANTENNA TYPE	AG,EC,NB,PN,SN, BN,PA		AG
ANTENNA GAIN, DB	-99.900 TO 99.900		90.000

#####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SN XM220

Device Name : XM220
Editor Name : FS:SS2
Creation Date : 26 Mar 85
Date of Last Use : 22 Mar 85
Current Uses : 1
Descriptor : TEST 8 MSK
#####PRIV.DATA: RLPM: -1
PFLAG: 1
DULOC: 0 0

Display User Parameters? (Y/N): Y

Amplifier Parameter Name	Option or Range	Default Value	Current Value
GAIN, DB	-200.000 TO 200.000		20.000

#####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

SM FA385

Device Name : FA385
 Editor Name : FSC552
 Creation Date : 26 Mar 85
 Date of Last Use : 22 Mar 85
 Current User : 2
 Descriptor :
 \$\$\$PRIU.DAT: RLPT: -1
 PFLAG: 2
 DULOC: 0 0

Display User Parameters? (Y/N): Y

Filter Parameter Name	Option or Range	Default Value	Current Value

FILTER TYPE	CS, BU, BT, BE, LE, PR, PZ, FS		CS
CENTER FREQUENCY, MHZ	0.001 TO 100000.000		7950.000
3-DB BANDWIDTH, MHZ	0.001 TO 999.999		2.000
NO. OF POLES	1 TO 30		11
RIPPLE FACTOR, DB	0.000 TO 3.000		0.100

\$\$\$PRIU.DAT/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSC55 Command: SM

Enter Entity Name: DA79

Device Name : DA79
 Editor Name : FSCSS2
 Creation Date : 26 Mar 85
 Date of Last Use : 22 Mar 85
 Current Uses : 1
 Description : TEST 8 MSK SOFT
 StepPRIV.DAT: RLPT: -1
 PFLAG: 1
 DULOC: 0 0

Display User Parameters? (Y/N): Y

Demodulator Parameter Name	Option or Range	Default Value	Current Value
DEMODULATOR TYPE	BP,DP,OP,OO,RP, 16,FS,MS,CP,AP, PN,FH,PF		MS
FREQUENCY, MHZ	0.001 TO 100000.000		7950.000
TYPE-TIMING LOCK LOOP	DF,PU		DF
BANDWIDTH-TIMING LOCK LOOP, HZ	0.000 TO 1000000.000		0.000
DAMPING FACTOR-TIMING LOOP	0.010 TO 9.990	0.707	0.707
TYPE-PHASE LOCK LOOP	DF,PU		DF
ORDER-PHASE LOCK LOOP	2,3		2
BANDWIDTH-PHASE LOCK LOOP, HZ	0.000 TO 1000000.000		0.000
DAMPING FACTOR-PHASE LOOP	0.010 TO 9.990	0.707	0.707
AGC-TIMING & PHASE LOCK LOOPS LIMITATION AT ZERO DBU MINIMUM SIGNAL LEVEL, DBU	VE,PL,NO VE,NO -200.000 TO 0.000		NO NO
DECISION TYPE DETECTOR TYPE	MA,SO ID,FS		-10.000 50 ID

StepPRIV.DAT/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

```

Device Name      : YU14
Editor Name      : D0922
Creation Date     : 12 Mar 85
Date of Last Use : 22 Mar 85
Current Uses      : 22
Descriptor        : TEST VA HARD
ASMPRIU.DATA:    RLPMNT: -1
                  PFLAG: 22
                  DULOC: 0 0

```

DULOC: 0 0

Decoder Parameter Name	Option or Range	Default Value	Current Value
DECODE TYPE	DF,CN,BI,SI,SB		CN
INPUT RATE	2 TO 4		2
OUTPUT RATE	1 TO 3		1
CONSTRAINT LENGTH	2 TO 9		7
1 POLYNOMIAL COEFFICIENT 1	0, 1		1
1 POLYNOMIAL COEFFICIENT 2	0, 1		1
1 POLYNOMIAL COEFFICIENT 3	0, 1		1
1 POLYNOMIAL COEFFICIENT 4	0, 1		1
1 POLYNOMIAL COEFFICIENT 5	0, 1		0
1 POLYNOMIAL COEFFICIENT 6	0, 1		0
1 POLYNOMIAL COEFFICIENT 7	0, 1		1
2 POLYNOMIAL COEFFICIENT 1	0, 1		1
2 POLYNOMIAL COEFFICIENT 2	0, 1		0
2 POLYNOMIAL COEFFICIENT 3	0, 1		1
2 POLYNOMIAL COEFFICIENT 4	0, 1		1
2 POLYNOMIAL COEFFICIENT 5	0, 1		0
2 POLYNOMIAL COEFFICIENT 6	0, 1		1
2 POLYNOMIAL COEFFICIENT 7	0, 1		1
STATE TRANS PATH MEMORY	20 TO 60		40
INPUT SYMBOL DECISIONS	HA,SO		SO
NO. OF QUANT BITS	2 TO 5		3
QUANT THRESH SPACING SPEC	UM,UD		UM
QUANT THRESH SPACING	0.100 TO 3.000		0.500
METRIC ASSIGNMENT 1			
-METRIC 1	0.000000E+00 TO 9.999999E+37		0.000
-METRIC 2	0.000000E+00 TO 9.999999E+37		7.000
METRIC ASSIGNMENT 2			
-METRIC 1	0.000000E+00 TO 9.999999E+37		1.000
-METRIC 2			

0.000000E+00 TO 9.999990E+37		6.000
METRIC ASSIGNMENT 3		
-METRIC 1	0.000000E+00 TO 9.999990E+37	2.000
-METRIC 2	0.000000E+00 TO 9.999990E+37	5.000
METRIC ASSIGNMENT 4		
-METRIC 1	0.000000E+00 TO 9.999990E+37	3.000
-METRIC 2	0.000000E+00 TO 9.999990E+37	4.000
METRIC ASSIGNMENT 5		
-METRIC 1	0.000000E+00 TO 9.999990E+37	4.000
-METRIC 2	0.000000E+00 TO 9.999990E+37	3.000
METRIC ASSIGNMENT 6		
-METRIC 1	0.000000E+00 TO 9.999990E+37	5.000
-METRIC 2	0.000000E+00 TO 9.999990E+37	2.000
METRIC ASSIGNMENT 7		
-METRIC 1	0.000000E+00 TO 9.999990E+37	6.000
-METRIC 2	0.000000E+00 TO 9.999990E+37	1.000
METRIC ASSIGNMENT 8		
-METRIC 1	0.000000E+00 TO 9.999990E+37	7.000
-METRIC 2	0.000000E+00 TO 9.999990E+37	0.000

***PRIU.DAT/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

ACCEPTANCE TEST 9

B-95

PHASE NOISE ACCEPTANCE TEST

XT34



```

Enter FSCSS Command: SH SY26

System Name      : SY26
Editor Name      : FSCSS2
Creation Date    : 18 Mar 85
Date of Last Run/Restart : 1 Apr 85
# of Transmit Terminals : 1
# of Receive Terminals : 0
# of Satellites : 0
# of Transmission Paths : 1

xxxxPRIU.DAT: RLPNT: -1 PFLAG: 15
              STPPR: 437

Linkage Specification : BT
TDMA "Devices" : (None)
Demand Access "Devices" : (None)

SY26 Descriptor: TEST OSC. PHASE NOISE

Xmit Recv      Transmission
# Elem Code Path Devices
1 XT34 0 02 (None)

Display Associated Device Linkage? (Y/N): Y

Orig Device Dest Device
# Elem Position Elem Position
1 XT34 IAB1 XT34 IAB7
2 XT34 IAB2 XT34 IAB6

xxxxPRIU.SYST: Display Simulation Status Fields? (Y/N): N

Enter FSCSS Command: SH XT34

Element Name      : XT34
Editor Name      : FSCSS2
Creation Date    : 18 Mar 85
Date of Last Use : 26 Mar 85
Current Uses     : 2
Number of Segments : 1

xxxxPRIU.DAT: RLPNT: -1 PFLAG: 2
Latitude : 0 Deg 0 Min N
Longitude : 0 Deg 0 Min E
Altitude : 0.000 Kilometers

XT34 Descriptor: PHASE NOISE ACCT TEST

# Code Count Devices
1 AB 7 GS178-MA112-QF21-NS81-ZF1-DA149-ZB1

Enter FSCSS Command: Y
Unrecognized Command

Enter FSCSS Command: N
Unrecognized Command

Enter FSCSS Command:

```

MA112

Device Name : MA112
Editor Name : FSCSS2
Creation Date : 18 Mar 85
Date of Last Use : 18 Mar 85
Current Uses :
Descriptor : TEST PHASE NOISE
xxxxPRIU.DATA: RLPNT: -1
PFLAG: 1
DULOC: 0 0

Display User Parameters? (Y/N): Y

Modulator
Parameter Name

MODULATOR TYPE

Option or Range	Default Value	Current Value
BP, OP, OO, MS, DP,		
SP, 16, AP, FS, CP,		
PN, FH, PF, CU, FN,		
PU		BP
0.001 TO		
100000.000		70.000

FREQUENCY, MHZ

xxxxPRIU.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

SN OF21

Device Name : OF21
 Editor Name : FSC552
 Creation Date : 1 Apr 85
 Date of Last Use : 18 Mar 85
 Current User : 1
 Description : TEST PHASE NOISE 50 POIN
 \$\$\$PRIV.DATA: RLNT: -1
 PFLAG: 1
 DULOC: 0 0

Display User Parameters? (Y/N): Y

Frequency Translator Parameter Name	Option or Range	Default Value	Current Value
TRANSLATION FREQUENCY, MHZ	-1000000.000 TO 1000000.000		0.000
OSCILLATOR NOISE MODEL	VE,NO		VE
POWER LAU PHASE NOISE MODEL	VE,NO		VE
FREQUENCY SEPARATION, HZ	1000000.000		2.000
POWER SERIES COEF H0, RAD/Hs	1.000 TO 0.000 TO		1.260000E-10
POWER SERIES COEF H2, RAD/Hs	1.000 TO 0.000 TO		0.010
POWER SERIE COEF H3, RAD/Hs	1.000 TO 0.000 TO		0.200

\$\$\$PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSC55 Command:

SH OF21

Device Name : OF21
 Editor Name : FSC552
 Creation Date : 1 Apr 85
 Date of Last Use : 18 Mar 85
 Current Uses : 1
 Descriptor : TEST PHASE NOISE 50 POIN
 SHSPRIU.DATA: RLPHNT: -1
 PFLAG: 1
 DULOC: 0 0

Display User Parameters? (Y/N): Y

Frequency Translator Parameter Name	Option or Range	Default Value	Current Value
TRANSLATION FREQUENCY, MHZ	-1000000.000 TO 1000000.000		0.000
OSCILLATOR NOISE MODEL	VE,NO		VE
POWER LAW PHASE NOISE MODEL	VE,NO		VE
FREQUENCY SEPARATION, HZ	1.000 TO 1000000.000		2.000
POWER SERIES COEF M0, RAD/HZ	0.000 TO 1.000		1.260000E-10
POWER SERIES COEF M2, RAD/HZ	0.000 TO 1.000		0.010
POWER SERIES COEF M3, RAD/HZ	0.000 TO 1.000		0.200

SHSPRIU.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH NS81

Device Name : NS81
 Editor Name : FSC552
 Creation Date : 1 Apr 85
 Date of Last Use : 18 Mar 85
 Current Uses : 1
 Descriptor : 1.79E20
 SHSPRIU.DATA: RLPHNT: -1
 PFLAG: 1
 DULOC: 0 0

Display User Parameters? (Y/N): Y

Noise Source Parameter Name	Option or Range	Default Value	Current Value
TYPE OF NOISE	TE,SA		TE
EFFECTIVE NOISE TEMP,K	0.000000E+00 TO 1.000000E+23		0.000

SHSPRIU.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

DA149

Device Name : DA149
 Editor Name : FSCS52
 Creation Date : 1 Apr 85
 Date of Last Use : 18 Mar 85
 Current User :
 Description : TEST PHASE NOISE.
 XXXXPRIV.DAT: ALPNT: -1
 PFLAG: 1
 DULOC: 0 0

Display User Parameters? (Y/N): Y

Demodulator
 Parameter Name

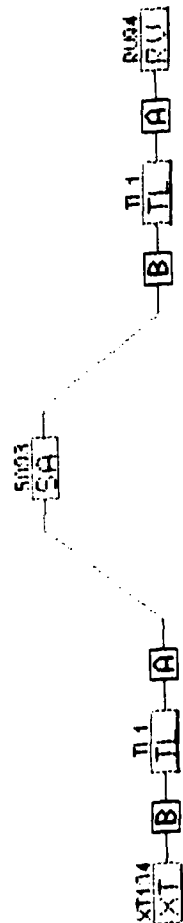
Demodulator Parameter Name	Option or Range	Default Value	Current Value
DEMODULATOR TYPE			
FREQUENCY, MHZ	BP, DP, OP, OO, SP, 16, FS, MS, CP, AP, PN, FH, PF		BP
TYPE-TIMING LOCK LOOP BANDWIDTH-TIMING LOCK LOOP, HZ	1000000.000 DF, PU		70.000 DF
DAMPING FACTOR-TIMING LOOP	1000000.000 0.010 TO 9.990	0.707	0.100 0.707
TYPE-PHASE LOCK LOOP ORDER-PHASE LOCK LOOP BANDWIDTH-PHASE LOCK LOOP, HZ	DF, PU 2, 3		DF 2
DAMPING FACTOR-PHASE LOOP	1000000.000 0.010 TO 9.990	0.707	5.446 0.707
ACC-TIMING & PHASE LOCK LOOPS LIMITATION AT ZERO DBU MINIMUM SIGNAL LEVEL, DBU	VE, PL, NO VE, NO -200.000 TO 0.000		NO NO
DECISION TYPE DETECTOR TYPE	MA, SO ID, FS		MA ID

XXXXPRIV.DAT/TEST: DISPLAY ALL FIELDS? (Y/N): N

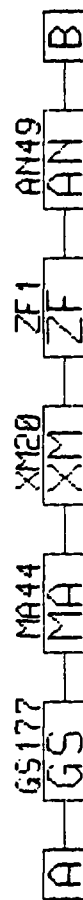
ACCEPTANCE TEST 10

B-102

SY89



TEST 10
XT134



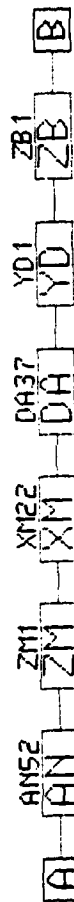
TEST 10 SATELLITE W/DE

SA93

ANS1 AN ZF DA193 ZB1 EDI MA48 XTE1 AN50 B

TEST REMOD WITH DIFFERENTIAL DECODER

RV94



SH SY89

System Name : SY89
Editor Name : FSCSS2
Creation Date : 22 Mar 85
Date of Last Run/Restart : 22 Mar 85
of Transmit Terminals : 1
of Receive Terminals : 1
of Satellites : 1
of Transmission Paths : 2

Linkage Specification : CE
TDMA Devices : (None)
Demand Access "Devices" : (None)

SY89 Descriptor: read test w/diff enc

Xmit	Recv	Elem Code	Transmission Path Devices
1	XT134	SA93	BA TL1
2	SA93	RU94	BA TL1

Display Associated Device Linkage? (Y/N): Y

Orig	Device	Dest	Device
1	XT134	IAB1	SA93
2	XT134	IAB2	SA93
3	SA93	IAB4	RU94
4	SA93	IAB6	RU94
5	SA93	IAB5	RU94

xxxxPRIU.SYST: Display Simulation Status Fields? (Y/N): N

Enter FSCSS Command: SH XT134

Element Name : XT134
Editor Name : D8922
Creation Date : 6 Mar 85
Date of Last Use : 22 Mar 85
Current Uses : 3
Number of Segments : 1

XT134 Descriptor: TEST 10

Seg	Dev
1	AB
5	GS177-MA44-XM20-ZF1-AN49

Enter FSCSS Command:

4- S493

Element Name : S493
 Editor Name : FSC552
 Creation Date : 22 Mar 85
 Date of Last Use : 22 Mar 85
 Current Uses : 1
 Number of Segments : 1

xxxxPRIU.DAT: ALPNT: -1 PFLAG: 1
 Latitude : 1 Deg 0 Min N
 Longitude : 0 Deg 2 Min E
 Altitude : 35860.000 Kilometers

S493 Descriptor: test 10 satellite w/de

Seg Dev
 Code Count Devices
 1 AB 8 AN51-2F1-DA193-ZB1-ED1-MA48-XM21-AN50

Enter FSCSS Command: SH RU94

Element Name : RU94
 Editor Name : FSC552
 Creation Date : 22 Mar 85
 Date of Last Use : 22 Mar 85
 Current Uses : 1
 Number of Segments : 1

xxxxPRIU.DAT: ALPNT: -1 PFLAG: 1
 Latitude : 2 Deg 0 Min N
 Longitude : 3 Deg 0 Min E
 Altitude : 0.000 Kilometers

RU94 Descriptor: test remod w/diff dec

Seg Dev
 Code Count Devices
 1 AB 6 AN52-2M1-XM22-DA37-YD1-ZB1

Enter FSCSS Command:

GS177

Device Name : GS177
 Editor Name : D0922
 Creation Date : 6 Mar 85
 Date of Last Use : 20 Mar 85
 Current Uses : 4
 Descriptor : TEST 10
 2222PRIU.DATA: RLPNT: -1
 PFLAG: 4
 DULOC: 0 0

Display User Parameters? (Y/N): Y

Data Source Parameter Name	Option or Range	Default Value	Current Value
2222PRIU.TEST: SOURCE TYPE	IG, EX, AB, AI		IG
DATA RATE, KBPS	0.001 TO 1000000.000		1000.000

2222PRIU.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SM MA44

Device Name : MA44
 Editor Name : D0922
 Creation Date : 6 Mar 85
 Date of Last Use : 20 Mar 85
 Current Uses : 4
 Descriptor : TEST 10J
 2222PRIU.DATA: RLPNT: -1
 PFLAG: 4
 DULOC: 0 0

Display User Parameters? (Y/N): Y

Modulator Parameter Name	Option or Range	Default Value	Current Value
MODULATOR TYPE	BP, QP, OQ, MS, DP, BP, 16, AP, FS, CP, PN, FH, PF, CU, FH, PU		QP
FREQUENCY, MHZ	0.001 TO 100000.000		2000.000

2222PRIU.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

XM29

Device Name : XM29
 Editor Name : D0922
 Creation Date : 8 Mar 85
 Date of Last Use : 6 Mar 85
 Current Uses : 1
 Descriptor : TEST 10
 #####PRIV.DATA: RLPNT: -1
 PFLAG: 1
 DULOC: 0

Display User Parameters? (Y/N): Y

Amplifier Parameter Name	Option or Range	Default Value	Current Value
GAIN, DB	-200.000 TO 200.000		100.000

#####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH AN49

Device Name : AN49
 Editor Name : D0922
 Creation Date : 6 Mar 85
 Date of Last Use : 6 Mar 85
 Current Uses : 1
 Descriptor : TEST 10
 #####PRIV.DATA: RLPNT: -1
 PFLAG: 1
 DULOC: 0

Display User Parameters? (Y/N): Y

Antenna Parameter Name	Option or Range	Default Value	Current Value
APPLICATION ANTENNA TYPE	SU,SD,EX,ER,SS AQ,EC,NB,PN,SN, BN		EX
BEAMWIDTH 3-DB, DEG	0.010 TO 70.000		NB
ANTENNA POINTING SPEC POINTING ERROR, DEG	AE,PE 0.000 TO 10.000	0.000	PE 5.000 0.000

#####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

SH AMSI

Device Name : AMSI
Editor Name : D0922
Creation Date : 6 Mar 85
Date of Last Use : 22 Mar 85
Current Uses : 3
Descriptor : TEST 10
xxxxPRIV.DATA: ALPNT: -1
PFLAG: 3
DULOC: 0 0

Display User Parameters? (Y/N): Y

Antenna Parameter Name	Option or Range	Default Value	Current Value
APPLICATION	SU,SD,EX,ER,SS		SU
ANTENNA TYPE	AG,EC,NB,PN,SN, BN,PA,SA,BA		AG
ANTENNA GAIN, DB	-99.900 TO 99.900		60.000

xxxxPRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

4 DA193

Device Name : DA193
 Editor Name : D0022
 Creation Date : 8 Mar 85
 Date of Last Use : 22 Mar 85
 Current Uses : 5
 Descriptor : TEST 10
 *****DATA: RLPHNT: -1
 PFLAG: 5
 DULOC: 0 0

Display User Parameters? (Y/N): Y

Demodulator
 Parameter Name

DEMODULATOR TYPE

FREQUENCY, MHZ

TYPE-TIMING LOCK LOOP

BANDWIDTH-TIMING LOCK LOOP, HZ

DAMPING FACTOR-TIMING LOOP

TYPE-PHASE LOCK LOOP

ORDER-PHASE LOCK LOOP

BANDWIDTH-PHASE LOCK LOOP, HZ

DAMPING FACTOR-PHASE LOOP

AGC-TIMING & PHASE LOCK LOOPS

LIMITATION AT ZERO DBU

MINIMUM SIGNAL LEVEL, DBU

DECISION TYPE

DETECTOR TYPE

*****PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCS Command:

Option or Range	Default Value	Current Value
BP, DP, QP, OQ, BP, 16, FS, MS, CP, AP, PN, FH, PF		QP
0.001 TO 100000.000		8000.000
DF, PU		DF
0.000 TO 1000000.000		0.100
0.010 TO 9.990	0.707	0.707
DF, PU 2, 3		DF 2
0.000 TO 1000000.000		1.000
0.010 TO 9.990	0.707	0.707
YE, PL, NO		NO
YE, NO		NO
-200.000 TO 0.000		-13.340
HA, SO		HA
ID, FS		ID

ED1

Device Name : ED1
 Editor Name : FSCSS
 Creation Date : 14 Dec 84
 Date of Last Use : 26 Mar 85
 Current Uses : 6
 Descriptor : Permanent DIFF ENCODER
 XXXSPRIU.DATA: RLPNT: -1
 PFLAG: 6
 DULOC: 0

Display User Parameters? (Y/N): Y

Encoder Parameter Name	Option or Range	Default Value	Current Value
ENCODER TYPE	DF, CN, BI, SI, BS		DF

XXXXPRIU.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SM MA48

Device Name : MA48
 Editor Name : D0922
 Creation Date : 14 Mar 85
 Date of Last Use : 22 Mar 85
 Current Uses : 4
 Descriptor : TEST10
 XXXSPRIU.DATA: RLPNT: -1
 PFLAG: 4
 DULOC: 0

Display User Parameters? (Y/N): Y

Modulator Parameter Name	Option or Range	Default Value	Current Value
MODULATOR TYPE	BP, GP, OO, MS, DP, SP, IS, AP, FS, CP, PN, FH, PF, CU, FH, PU		OO
FREQUENCY, MHZ	0.001 TO 100000.000		3000.000

XXXXPRIU.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

SM X021

Device Name : X021
Editor Name : D0922
Creation Date : 8 Mar 85
Date of Last Use : 22 Mar 85
Current Uses : 3
Descriptor : TEST10
xxxxPRIU.DATA: RLPNT: -1
PFLAG: 3
DULOC: 0 0

Display User Parameters? (Y/N): Y

Amplifier Parameter Name	Option or Range	Default Value	Current Value
GAIN, DB	-200.000 TO 200.000		78.960

xxxxPRIU.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SM AN50

Device Name : AN50
Editor Name : D0922
Creation Date : 6 Mar 85
Date of Last Use : 22 Mar 85
Current Uses : 3
Descriptor : TEST 10
xxxxPRIU.DATA: RLPNT: -1
PFLAG: 3
DULOC: 0 0

Display User Parameters? (Y/N): Y

Antenna Parameter Name	Option or Range	Default Value	Current Value
APPLICATION	SU,SD,EX,ER,SS		SD
ANTENNA TYPE	AG,EC,NB,PN,SN, BN		AG
ANTENNA GAIN, DB	-99.900 TO 99.900		60.000

xxxxPRIU.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

AN52

Device Name : AN52
 Editor Name : D0022
 Creation Date : 8 Mar 85
 Date of Last Use : 22 Mar 85
 Current Uses : 2
 Description : TEST REMOD
 *****DATA: RLPHN: -1
 PFLAG: 2
 DULOC: 2

Display User Parameters? (Y/N): Y

Antenna Parameter Name	Option or Range	Default Value	Current Value
APPLICATION	SU,SD,EX,ER,SS		ER
ANTENNA TYPE	AG,EC,NB,PN,SN, BN,PA		NB
BEAMWIDTH 3-DB, DEG	0.010 TO 70.000		0.100
ANTENNA POINTING SPEC POINTING ERROR, DEG	AE,PE 0.000 TO 10.000	0.000	0.000

*****DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Commands:

.. XM22

Device Name : XM22
Editor Name : D0922
Creation Date : 8 Mar 85
Date of Last Use : 22 Mar 85
Current Uses : 2
Descriptor : TEST REMOD
xxxxPRIV.DAT: RLPNT: -1
PFLAG: 2
DULOC: 0 0

Display User Parameters? (Y/N): Y

Amplifier Parameter Name	Option or Range	Default Value	Current Value
GAIN, DB	-200.000 TO 200.000		0.000

xxxxPRIV.DAT:TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

SH DA37

Device Name : DA37
 Editor Name : D0922
 Creation Date : 14 Mar 85
 Date of Last Use : 22 Mar 85
 Current Users : 3
 Descriptor : TEST RENOD
 3333PRIU.DATA: RLPNT: -1
 PFLAG: 3
 DULOC: 0 0

Display User Parameters? (Y/N): Y

Demodulator
 Parameter Name

 DEMODULATOR TYPE

FREQUENCY, MHZ

TYPE-TIMING LOCK LOOP
 BANDWIDTH-TIMING LOCK LOOP, HZ

DAMPING FACTOR-TIMING LOOP

TYPE-PHASE LOCK LOOP
 ORDER-PHASE LOCK LOOP
 BANDWIDTH-PHASE LOCK LOOP, HZ

DAMPING FACTOR-PHASE LOOP

AGC-TIMING & PHASE LOCK LOOPS
 LIMITATION AT ZERO DBU
 MINIMUM SIGNAL LEVEL, DBU

DECISION TYPE
 DETECTOR TYPE

3333PRIU.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH YDI

Device Name : YDI
 Editor Name : FSCSS
 Creation Date : 13 Sep 83
 Date of Last Use : 2 Apr 85
 Current Users : 6
 Descriptor : Permanent DIFF DECODER
 3333PRIU.DATA: RLPNT: -1
 PFLAG: 6
 DULOC: 0 0

Display User Parameters? (Y/N): Y

Decoder
 Parameter Name

 Option or Range Default Value Current Value

 DECODER TYPE DF

3333PRIU.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N
 Enter FSCSS Commands:

Option or Range	Default Value	Current Value
BP, DP, OP, OQ, BP, 16, FS, MS, CP, AP, PN, FH, PF		OQ
100000.000		8000.000
DF, PU		DF
0.000 TO 1000000.000		0.100
0.010 TO 9.990	0.707	0.707
DF, PU		DF
2, 3		2
0.000 TO 1000000.000		1.000
0.010 TO 9.990	0.707	0.707
YE, PL, NO		NO
YE, NO		NO
-200.000 TO 0.000		HA
HA, SO		HA
ID, FS		ID

YDI

Device Name : YDI
Editor Name : FSCSS
Creation Date : 13 Sep 83
Date of Last Use : 2 Apr 85
Current Uses : 6
Descriptor : Permanent DIFF DECODER
xxxxPRIV.DATA: RLPM: -1
PFLAG: 6
DULOC: 0 0

Display User Parameters? (Y/N): Y

Decoder Parameter Name	Option or Range	Default Value	Current Value
DECODER TYPE	DF,CN,BI,S1,S8		DF

xxxxPRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

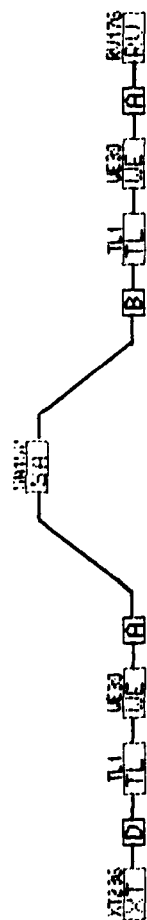
Enter FSCSS Command:

ACCEPTANCE TEST 11

B-119

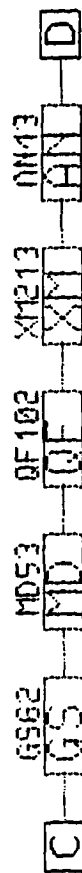
ATMOSPHERIC EFFECTS WITH UP- AND DOWNLINK

SY53



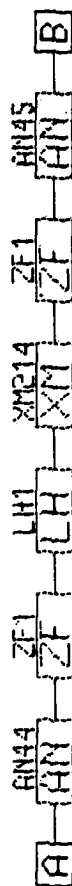
ATMOSPHERIC EFFECTS TEST TRANSMIT TERMINAL

XT236



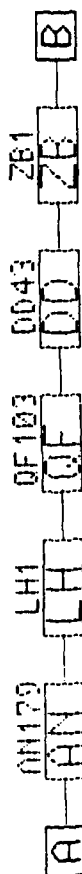
ATMOSPHERIC EFFECTS TEST SATELLITE

SA152



ATMOSPHERIC EFFECTS TEST RECEIVE TERMINAL

RV176



AD-A155 647

FLEXIBLE SATELLITE COMMUNICATIONS SYSTEMS SIMULATOR(U)
COMPUTER SCIENCES CORP FALLS CHURCH VA SYSTEMS DIV
D F ARNAUD ET AL. 16 MAY 85 DCA100-77-C-0020

3/3

UNCLASSIFIED

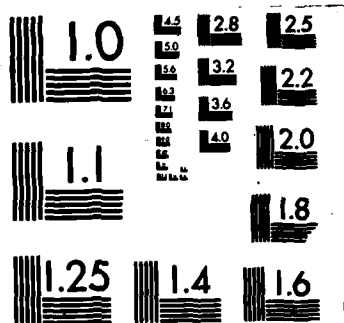
F/G 17/2

NL

END

FILED

ENC



Enter FSCSS Command: ah we39

Device Name : WE39
 Editor Name : FSCSS2
 Creation Date : 1 Apr 85
 Date of Last Use : 1 Apr 85
 Current Uses : 3
 Descriptor : AE LINEAR, VERTICAL, 30
 #####PRIV.DAT: RLPMT: -1
 PFLAG: 3
 DULOC: 0 0

Display User Parameters? (Y/N): Y

Atmospheric Effects			
Parameter Name	Option or Range	Default Value	Current Value
ATMOSPHERIC ABSORPTION	YE,NO		YE
WATER VAPOR DENSITY, G/CM	0.000 TO 15.000	7.500	7.510
CLOUD ATTENUATION	YE,NO		YE
CLOUD WATER VAPOR DENS,G/CM	0.000 TO 99.900	0.300	15.000
CLOUD THICKNESS, KM	0.000 TO 99.900	1.000	10.000
CLOUD TEMP, K	200.000 TO 400.000	273.000	300.000
RAIN ATTENUATION	YE,NO		YE
RAINFALL ZONE	A,B,C,D1,D2,D3,E,F,G,H		D3
TIME AVAILABILITY (<=0.99999)	0.980 TO 1.000		1.000
0 DEG ISOTHERM HEIGHT, KM	0.000 TO 5.000		4.000
SPATIAL DIVERSITY	YE,NO		NO
CROSS POLARIZATION	YE,NO		YE
POLARIZATION TYPE	CI,LI		LI
RAIN DROP AXIS ORIENTATN, DEG	0.000 TO 90.000	30.000	30.000
S.D. OF MEAN OF ORIENTAT, DEG	0.000 TO 90.000	3.000	3.000
POLARIZATION TILT ANGLE, DEG	0.000 TO 45.000		30.000
POLARIZATION DIRECTION	NO,VE		VE

#####PRIV.DAT/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

SM XT236

Element Name : XT236
Editor Name : D0279
Creation Date : 18 Dec 84
Date of Last Use : 1 Apr 85
Current Uses : 2
Number of Segments : 1

xxxxPRIU.DAT: RLPNT: -1 PFLAG: 2

Latitude : 40 Deg 0 Min N
Longitude : 120 Deg 0 Min E
Altitude : 0.000 Kilometers

XT236 Descriptor: AE TEST TERM

Seg Dev
8 Code Count Devices
1 CD 5 G562-MD53-QF102-XT213-AN43

Enter FSCSS Command: SM G562

Device Name : G562
Editor Name : D0917
Creation Date : 14 Dec 84
Date of Last Use : 28 Mar 85
Current Uses : 0
Descriptor : 9.6 KBPS SOURCE
xxxxPRIU.DAT: RLPNT: -1
PFLAG: 0
DULOC: 0 0

Display User Parameters? (Y/N): Y

Data Source

Parameter Name	Option or Range	Default Value	Current Value
xxxxPRIU.TEST: SOURCE TYPE	IG,EX,AG,A1	IG	IG
DATA RATE,KBPS	0.001 TO 1000000.000		9.600

xxxxPRIU.DAT:TEST: DISPLAY ALL FIELDS? (Y/N):

SH MD53

Device Name : MD53
 Editor Name : D0917
 Creation Date : 28 Mar 85
 Date of Last Use : 28 Mar 85
 Current Uses : 0
 Descriptor : 8-FSK, 36.11 KHZ, 1 GHZ
 #####PRIV.DATA: RLPT: -1
 PFLAG: 0
 DULOC: 0

Display User Parameters? (Y/N): Y

Modulator

Parameter Name

MODULATOR TYPE

Option or Range Default Value Current Value

BP,OP,OG,MS,DP,
 BP,16,AP,FS,CP,
 PH,FH,PF,CU,FH,
 PU

FS

1000.000

8

36.110

BI

FREQUENCY, MHZ

ALPHABET SIZE

FREQUENCY SPACING,KHZ

INPUT SYMBOL TYPE

BI,SY

#####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): 00

Enter FSCSS Command: SH QF102

Device Name : QF102
 Editor Name : D0917
 Creation Date : 28 Mar 85
 Date of Last Use : 28 Mar 85
 Current Uses : 0
 Descriptor : AE TEST 9 GHZ FT
 #####PRIV.DATA: RLPT: -1
 PFLAG: 0
 DULOC: 0

Display User Parameters? (Y/N): Y

Frequency Translator

Parameter Name

TRANSLATION FREQUENCY, MHZ

OSCILLATOR NOISE MODEL

#####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

Option or Range Default Value Current Value

-1000000.000 TO
 1000000.000
 YE,NO

9000.000

NO

SH XR213

Device Name : XR213
Editor Name : D0279
Creation Date : 28 Mar 85
Date of Last Use : 28 Mar 85
Current Uses : 2
Descriptor : XMIT AMP 100DB
xxxxPRIU.DATA: RLPHIT: -1
PFLAG: 2
DULOC: 0 0

Display User Parameters? (Y/N): Y

Amplifier Parameter Name	Option or Range	Default Value	Current Value
GAIN, DB	-200.000 TO 200.000		100.000

xxxxPRIU.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH AN43

Device Name : AN43
Editor Name : D0279
Creation Date : 8 Nov 84
Date of Last Use : 28 Mar 85
Current Uses : 2
Descriptor : ET XMIT ANT GAIN - 45.5
xxxxPRIU.DATA: RLPHIT: -1
PFLAG: 2
DULOC: 0 0

Display User Parameters? (Y/N): Y

Antenna Parameter Name	Option or Range	Default Value	Current Value
APPLICATION ANTENNA TYPE	SU,SD,EX,ER,SS AG,EC,NB,PN,SN, BN		EX AG
ANTENNA GAIN, DB	-99.900 TO 99.900		45.500

xxxxPRIU.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

SN SA152

Element Name : SA152
Editor Name : FSCS2
Creation Date : 28 Mar 85
Date of Last Use : 1 Apr 85
Current Uses : 2
Number of Segments : 1

SA152 Descriptor: AE TEST SATELLITE

Seg Dev
Code Count Devices
1 AB 6 AN44-ZF1-LH1-XM214-ZF1-AN45

Enter FSCS Command: SH AN44

Device Name : AN44
Editor Name : D0279
Creation Date : 8 Nov 84
Date of Last Use : 28 Mar 85
Current Uses : 2
Descriptor : SU ANT GAIN = 23.5
xxxxPRIV.DAT: RLPT: -1
PFLAG: 2
DULOC: 0 0

Display User Parameters? (Y/N): Y

Antenna Parameter Name	Option or Range	Default Value	Current Value
APPLICATION	SU,SD,EX,ER,SS		SU
ANTENNA TYPE	AG,EC,NB,PN,SN, BN,PA,SA,BA		AG
ANTENNA GAIN, DB	-99.900 TO 99.900		23.500

xxxxPRIV.DAT/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCS Command:

Enter FSCSS Command: sh xm214

Device Name : XM214
Editor Name : D0279
Creation Date : 8 Nov 84
Date of Last Use : 28 Mar 85
Current Uses : 2
Descriptor : SAT AMP 100DB
xxxxPRIU.DATA: RLPNT: -1
PFLAG: 2
DULOC: 0

Display User Parameters? (Y/N): Y

Amplifier Parameter Name	Option or Range	Default Value	Current Value
GAIN, DB	-200.000 TO 200.000		100.000

xxxxPRIU.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): n

Enter FSCSS Command:

Enter FSCSS Command: sh an45

Device Name : AN45
Editor Name : D0279
Creation Date : 8 Nov 84
Date of Last Use : 28 Mar 85
Current Uses : 2
Descriptor : SD ANT GAIN - 25.8
xxxxPRIU.DATA: RLPNT: -1
PFLAG: 2
DULOC: 0

Display User Parameters? (Y/N): Y

Antenna Parameter Name	Option or Range	Default Value	Current Value
APPLICATION	SU,SD,EX,ER,SS		SD
ANTENNA TYPE	AG,EC,NB,PN,SM, BN		AG
ANTENNA GAIN, DB	-99.900 TO 99.900		25.900

xxxxPRIU.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): n

Enter FSCSS Command:

SM RU176

Element Name : RU176
Editor Name : FSCSS2
Creation Date : 1 Apr 85
Date of Last Use : 1 Apr 85
Current Uses : 1
Number of Segments : 1
xxxxPRIV.DAT: RLPH: -1 PFLAG: 1
Latitude : 40 Deg 0 Min N
Longitude : 120 Deg 0 Min E
Altitude : 0.152 Kilometers

RU176 Descriptor: AE EFFECTS RU TERM

Seg Dev
s Code Count Devices
1 AB 5 AN179-LH1-QF103-DD43-2B1

Enter FSCSS Command: SM AN170

Device Name : AN179
Editor Name : D0279
Creation Date : 18 Dec 84
Date of Last Use : 1 Apr 85
Current Uses : 2
Descriptor : AE TEST RX TERM ANT
xxxxPRIV.DAT: RLPH: -1
PFLAG: 2
DULOC: 0 0

Display User Parameters? (Y/N): Y

Antenna Parameter Name	Option or Range	Default Value	Current Value
APPLICATION	SU,SD,EX,ER,SS		ER
ANTENNA TYPE	AG,EC,NB,PN,SM, BN,PA		AG
ANTENNA GAIN, DB	-99.900 TO 99.900		45.000

xxxxPRIV.DAT:TEST: DISPLAY ALL FIELDS? (Y/N):

SH OF103

Device Name : OF103
 Editor Name : D0917
 Creation Date : 28 Mar 85
 Date of Last Use : 1 Apr 85
 Current Uses : 1
 Descriptor : AE TEST DOWN CONU, 10CHZ
 xxxPRIU.DATA: RLPT: -1
 PFLAG: 1
 DULOC: 0 0

Display User Parameters? (Y/N): Y

Frequency Translator Parameter Name	Option or Range	Default Value	Current Value
TRANSLATION FREQUENCY, MHZ	-1000000.000 TO 1000000.000		-9000.000
OSCILLATOR NOISE MODEL	YE,NO		NO

xxxPRIU.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): BB

Enter FSCSS Command: SH D043

Device Name : DD43
 Editor Name : D0279
 Creation Date : 28 Mar 85
 Date of Last Use : 1 Apr 85
 Current Uses : 2
 Descriptor : 8-FSK
 xxxPRIU.DATA: RLPT: -1
 PFLAG: 2
 DULOC: 0 0

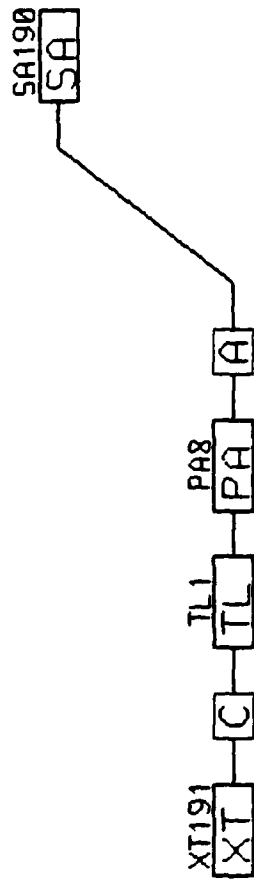
Display User Parameters? (Y/N): Y

Demodulator Parameter Name	Option or Range	Default Value	Current Value
DEMODULATOR TYPE			
FREQUENCY, MHZ	BP, DP, OP, OQ, BP, 16, FS, MS, CP, AP, PH, FH, PF		FS
ALPHABET SIZE	100000.000 TO 2, 4, 8, 16		1000.000
FREQUENCY SPACING, KHZ	0.001 TO 9999.999		36.110
BANDWIDTH-TIMING LOCK LOOP, HZ	0.000 TO 1000000.000		0.000
DAMPING FACTOR-TIMING LOOP	0.010 TO 9.990	0.707	0.707
ACC-TIMING LOCK LOOP LIMITATION AT ZERO DBM DECISION TYPE	YE,NO YE,NO NA,SO		NO YE NA

xxxPRIU.DATA/TEST: DISPLAY ALL FIELDS? (Y/N):

ACCEPTANCE TEST 12

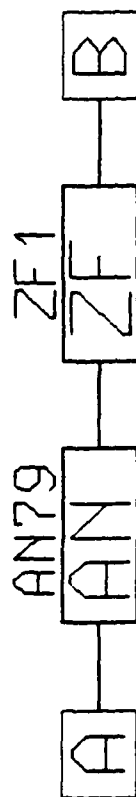
NUCLEAR EFFECTS CU CONFIGURATION
SY23



NUCLEAR EFFECTS CU TRANSMIT TERMINAL
XT191

The diagram shows a signal flow from left to right. On the far left, there are two input blocks: 'A' and 'D'. Block 'A' is connected to block 'MI46', which is then connected to block 'B'. Block 'D' is connected to block 'MI47'. Both 'MI46' and 'MI47' are connected to block 'B'. From block 'B', the signal path continues through a series of blocks: 'ZF1', 'FA', 'XM433', 'ZF1', 'AN', and finally 'C'. Each block is represented by a rectangle with its label inside. The labels 'MI46', 'MI47', 'XM433', and 'AN' are placed above their respective blocks, while 'A', 'B', 'C', 'D', 'ZF1', and 'FA' are placed below theirs.

NUCLEAR EFFECTS CU TEST SATELLITE
SA198



```

Enter FSCSS Command: SH SY23
System Name      : SY23
Editor Name      : FSCSS2
Creation Date    : 1 Apr 85
Date of Last Run/Restart : 1 Apr 85
# of Transmit Terminals : 1
# of Receive Terminals : 0
# of Satellites : 1
# of Transmission Paths : 1

SY23 Descriptor: TEST NUKEN.
Xmit Recv      Transmission
# Elem Code Path Devices
1 XT191 SA190 CA TL1 PA8

Display Associated Device Linkage? (Y/N): Y
No Associated Devices

xxxxPRIV.SYST: Display Simulation Status Fields? (Y/N): N

Enter FSCSS Command: SH XT191
Element Name      : XT191
Editor Name      : FSCSS2
Creation Date    : 1 Apr 85
Date of Last Use : 1 Apr 85
Current Uses     : 1
Number of Segments : 3

XT191 Descriptor: TEST NUKES U.CU
Seg  Dev
# Code Count Devices
1 BC 5 ZF1-FA243-XM433-ZF1-AN93
2 AB 1 MI46
3 DB 1 MI47

Enter FSCSS Command: SH SA190
Element Name      : SA190
Editor Name      : FSCSS2
Creation Date    : 1 Apr 85
Date of Last Use : 1 Apr 85
Current Uses     : 1
Number of Segments : 1

SA190 Descriptor: TEST NUKEN U.CU
Seg  Dev
# Code Count Devices
1 AB 2 AN79-ZF1

Enter FSCSS Command:
xxxxPRIV.DAT: RLPNT: -1 PFLAG: 5
BTPPTR: 547

Linkage Specification : GE
TDMA Devices : (None)
Demand Access "Devices": (None)

xxxxPRIV.DAT: RLPNT: -1 PFLAG: 1
Latitude : 0 Deg 0 Min N
Longitude : 0 Deg 0 Min E
Altitude : 0.000 Kilometers

xxxxPRIV.DAT: RLPNT: -1 PFLAG: 1
Latitude : 0 Deg 0 Min N
Longitude : 0 Deg 0 Min E
Altitude : 35860.000 Kilometers

```

SH FA243

Device Name : FA243
 Editor Name : FSC552
 Creation Date : 1 Apr 85
 Date of Last Use : 1 Apr 85
 Current Uses : 1
 Descriptor : TEST NUKEM
 xxxpriu.data: RLPT: -1
 PFLAG: 1
 DULOC: 0

Display User Parameters? (Y/N): Y

Filter Parameter Name	Option or Range	Default Value	Current Value
FILTER TYPE			
CENTER FREQUENCY, MHZ	0.001 TO 100000.000	CS	8000.000
3-DB BANDWIDTH, MHZ	0.001 TO 999.999		30.000
NO. OF POLES	1 TO 30		11
RIPPLE FACTOR, DB	0.000 TO 3.000		0.010

xxxxpriu.data/test: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH XM433

Device Name : XM433
 Editor Name : FSC552
 Creation Date : 1 Apr 85
 Date of Last Use : 1 Apr 85
 Current Uses : 1
 Descriptor : TEST NUKEM
 xxxpriu.data: RLPT: -1
 PFLAG: 1
 DULOC: 0

Display User Parameters? (Y/N): Y

Amplifier Parameter Name	Option or Range	Default Value	Current Value
GAIN, DB			
	-200.000 TO 200.000		25.000

xxxxpriu.data/test: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

Enter FSCSS Command: SH AN93

Device Name : AN93
Editor Name : FSCSS2
Creation Date : 1 Apr 85
Date of Last Use : 1 Apr 85
Current Uses : 1
Descriptor : TEST NUKEM
xxxxPRIU.DATA: RLPNT: -1
PFLAG: 1
DULOC: 0 0

Display User Parameters? (Y/N): Y

Antenna Parameter Name	Option or Range	Default Value	Current Value
APPLICATION	SU,SD,EX,ER,SS		EX
ANTENNA TYPE	AG,EC,NB,PN,SN,		AG
ANTENNA GAIN, DB	BN -99.900 TO 99.900		90.000

xxxxPRIU.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: @M MI46

Device Name : MI46
Editor Name : FSCSS2
Creation Date : 1 Apr 85
Date of Last Use : 1 Apr 85
Current Uses : 1
Descriptor :
xxxxPRIU.DATA: RLPNT: -1
PFLAG: 1
DULOC: 0 0

Display User Parameters? (Y/N): Y

Modulator Parameter Name	Option or Range	Default Value	Current Value
MODULATOR TYPE	BP,OP,OO,MS,DP, SP,IG,AP,FS,CP, PN,FH,PF,CU,FN, PU		CU
FREQUENCY, MHz	0.001 TO 100000.000		7900.000

xxxxPRIU.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

SM MI47

Device Name : MI47
 Editor Name : FSC552
 Creation Date : 1 Apr 85
 Date of Last Use : 1 Apr 85
 Current Uses : 1
 Descriptor :
 #####PRIV.DATA: RLPMNT: -1
 PFLAG: 1
 DULOC: 0 0

Display User Parameters? (Y/N): Y

Modulator Parameter Name	Option or Range	Default Value	Current Value
MODULATOR TYPE	BP, OP, OQ, MS, DP, BP, IG, AP, FS, CP, PN, FH, PF, CU, FH, PU		CU
FREQUENCY, MHZ	0.001 TO 100000.000		8010.000

#####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSC55 Command: SM AN79

Device Name : AN79
 Editor Name : FSC552
 Creation Date : 1 Apr 85
 Date of Last Use : 1 Apr 85
 Current Uses : 1
 Descriptor : TEST NUKEM
 #####PRIV.DATA: RLPMNT: -1
 PFLAG: 1
 DULOC: 0 0

Display User Parameters? (Y/N): Y

Antenna Parameter Name	Option or Range	Default Value	Current Value
APPLICATION	SU, SD, EX, ER, SS		SU
ANTENNA TYPE	AG, EC, NB, PN, SN, BN, PA, SA, BA		AG
ANTENNA GAIN, DB	-99.900 TO 99.900		90.000

#####PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSC55 Command:

Enter FSCSS Command: SM TL1

Device Name : TL1
 Editor Name : FSCSS
 Creation Date : 20 Mar 84
 Date of Last Use : 26 Apr 85
 Current Uses : 11
 Descriptor : FSCSS Permanent Tran Los
 #####PRU.DATA: RLPH: -1
 PFLAG: 11
 DULOC: 0 0

Display User Parameters? (Y/N): Y

Transmission Loss Parameter Name	Option or Range	Default Value	Current Value
TRANSMISSION LOSS, DB	-300.000 TO 0.000		0.000

#####PRU.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

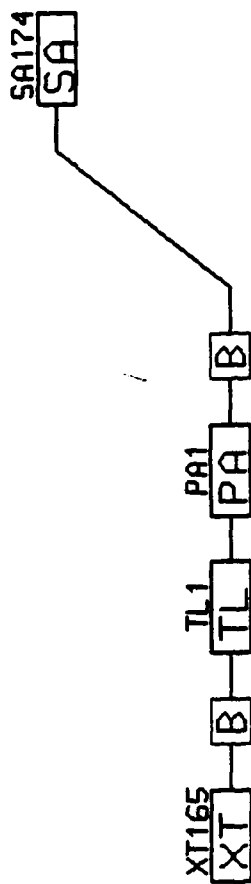
Enter FSCSS Command: SM PAB

Device Name : PAB
 Editor Name : FSCSS2
 Creation Date : 1 Apr 85
 Date of Last Use : 1 Apr 85
 Current Uses : 1
 Descriptor : TEST NUKEM
 #####PRU.DATA: RLPH: -1
 PFLAG: 1
 DULOC: 0 0

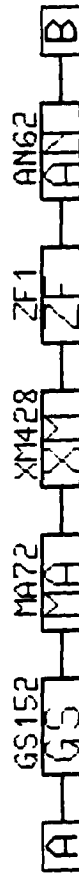
Display User Parameters? (Y/N): Y

Propagation Anomalies Parameter Name	Option or Range	Default Value	Current Value
DOPPLER	VE,NO VE,NO VE,NO		NO NO VE
SCINTILLATION	0.000 TO 30.000		1.000
NUCLEAR SCINTILLATION	1.000000E-04 TO 1.000000E+01		1.000000E-04
TOTAL ABSORPTION, DB	0.001 TO 10000.000		30.000
SIGNAL DECORRELATION TIME, SEC	0.010 TO 100000.000		1000.000
EST. SIMULATION BANDWIDTH, MHZ	0.100 TO 100000.000		1000.000
MAX. SYMBOL RATE, KBITS/SEC	0 TO 2147483647		10101
FREQ. SELECTIVE BANDWIDTH, MHZ			NO
CIR FUNCTION SEED			
ARBITRARY FLUCTUATION			

NUCLEAR EFFECTS BPSK TEST
SY44



NUCLEAR EFFECTS OPSK TRANSMIT TERMINAL
XT165



NUCLEAR EFFECTS BPSK TEST SATELLITE

SA174



```

SV44
System Name      : SV44
Editor Name      : FSCS2
Creation Date    : 28 Mar 85
Date of Last Run/Restart : 1 Apr 85
# of Transmit Terminals : 1
# of Receive Terminals : 0
# of Satellites : 1
# of Transmission Paths : 1

SV44 Descriptor: TEST NUKE 'EN.

Xmit Recv      Transmission
# Elem Elem Code Path Devices
1 XT165 SA174 88 TL1 PA1

Display Associated Device Linkage? (Y/N): Y

Orig Device Dest Device
# Elem Position Elem Position
1 XT165 IAB1 SA174 IBC4
2 XT165 IAB2 SA174 IBC3

####PRIU.SYST: Display Simulation Status Fields? (Y/N): N

Enter FSCSS Command: SH XT165

Element Name      : XT165
Editor Name      : FSCS2
Creation Date    : 28 Mar 85
Date of Last Use : 1 Apr 85
Current Uses     : 1
Number of Segments : 1

XT165 Descriptor: NUKE EM

Seg Dev
# Code Count Devices
1 AB 5 GS152-MAT2-KR428-ZF1-ANG2

Enter FSCSS Command: Y
Unrecognized Command

Enter FSCSS Command: N
Unrecognized Command

Enter FSCSS Command:

```

```

####PRIU.DATA: ALPMT: -1 PFLAG: 8
BTPTTR: 543

Linkage Specification : GE
TDMA Devices : (None)
Demand Access "Devices" : (None)

```

```

####PRIU.DATA: ALPMT: -1 PFLAG: 1

Latitude : 0 Deg 0 Min N
Longitude : 0 Deg 0 Min E
Altitude : 0.000 Kilometers

```

Enter FSCSS Command: SN SA174

Element Name : SA174
Editor Name : FSCSS2
Creation Date : 28 Mar 85
Date of Last Use : 1 Apr 85
Current Usage : 1
Number of Segments : 1

SA174 Descriptor: TEST NUKE 'EN.

Sig	Dev
8	Code Count
1	BC 4
	ANG3-ZF1-DA108-ZB1

Enter FSCSS Command:

2223PRIU.DAT: RLMT: -1 PFLAG: 1

Latitude : 0 Deg 0 Min N
Longitude : 0 Deg 0 Min E
Altitude : 35860.000 Kilometers

SM 05152

Device Name : QS152
Editor Name : FSC552
Creation Date : 28 Mar 85
Date of Last Use : 1 Apr 85
Current Uses : 3
Descriptor : TEST NUKE
3333PRIU.DATA: RLPHI: -1
PFLAG: 3
DULOC: 0

Display User Parameters? (Y/N): Y

Data Source Parameter Name	Option or Range	Default Value	Current Value
3333PRIU.TEST: SOURCE TYPE	IG,EX,AG,AI		IG
DATA RATE,KBPS	0.001 TO 1000000.000		10.000

3333PRIU.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SM MA72

Device Name : MA72
Editor Name : FSC552
Creation Date : 28 Mar 85
Date of Last Use : 1 Apr 85
Current Uses : 1
Descriptor : TEST NUKE
3333PRIU.DATA: RLPHI: -1
PFLAG: 1
DULOC: 0

Display User Parameters? (Y/N): Y

Modulator Parameter Name	Option or Range	Default Value	Current Value
MODULATOR TYPE	BP,OP,OG,RS,DP, SP,IG,AP,FS,CP, PN,FH,PF,CU,FH, PU		BP
FREQUENCY, MHZ	0.001 TO 100000.000		2000.000

3333PRIU.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

XM428

Device Name : XM428
 Editor Name : FSC552
 Creation Date : 28 Mar 85
 Date of Last Use : 1 Apr 85
 Current Uses : 2
 Descriptor : TEST NUKE
 XXXPRIU.DAT: RLPT: -1
 PFLAG: 2
 DULOC: 0

Display User Parameters? (Y/N): Y

Amplifier Parameter Name	Option or Range	Default Value	Current Value
GAIN, DB	-200.000 TO 200.000		200.000

XXXXPRIU.DAT:TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCS Command: SH AM62

Device Name : AM62
 Editor Name : FSC552
 Creation Date : 28 Mar 85
 Date of Last Use : 1 Apr 85
 Current Uses : 2
 Descriptor : TEST NUKE
 XXXPRIU.DAT: RLPT: -1
 PFLAG: 2
 DULOC: 0

Display User Parameters? (Y/N): Y

Antenna Parameter Name	Option or Range	Default Value	Current Value
APPLICATION ANTENNA TYPE	SU,SD,EX,ER,SS AC,EC,NB,PH,SN, BN		EX
ANTENNA GAIN, DB	-99.900 TO 99.900		AC 20.000

XXXXPRIU.DAT:TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCS Command:

Enter FSCSS Command:

TL1

Device Name : TL1
 Editor Name : FSCSS
 Creation Date : 20 Mar 84
 Date of Last Use : 1 Apr 85
 Current Uses : 40
 Descriptor : FSCSS Permanent Tran Los
 #####PRIV.DAT: RLPNT: -1
 PFLAG: 40
 DULOC: 0 0

Display User Parameters? (Y/N): Y

Parameter Name	Option or Range	Default Value	Current Value
TRANSMISSION LOSS, DB	-300.000 TO 0.000		0.000

#####PRIV.DAT:TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH PA1

Device Name : PA1
 Editor Name : FSCSS2
 Creation Date : 1 Apr 85
 Date of Last Use : 1 Apr 85
 Current Uses : 2
 Descriptor : END
 #####PRIV.DAT: RLPNT: -1
 PFLAG: 2
 DULOC: 0 0

Display User Parameters? (Y/N): Y

Propagation Anomalies Parameter Name	Option or Range	Default Value	Current Value
DOPPLER	YE,NO		NO
SCINTILLATION	YE,NO		NO
NUCLEAR SCINTILLATION	YE,NO		YE
TOTAL ABSORPTION, DB	0.000 TO 30.000		0.100
SIGNAL DECORRELATION TIME, SEC	1.000000E-04 TO 1.000000E+01		0.100
EST. SIMULATION BANDWIDTH, MHZ	10000.000 TO 100000.000		0.001
MAX. SYMBOL RATE, KBITS/SEC	0.010 TO 100000.000		10.000
FREQ. SELECTIVE BANDWIDTH, KHZ	0.100 TO 100000.000		20000.000
CIR FUNCTION SEED	2147483647		10101
ARBITRARY FLUCTUATION	YE,NO		NO

#####PRIV.DAT:TEST: DISPLAY ALL FIELDS? (Y/N): N

4 ANG3

Device Name : ANG3
Editor Name : FSCSS2
Creation Date : 28 Mar 85
Date of Last Use : 1 Apr 85
Current User : 3
Descriptor : TEST NUKEM
xxxxPRIU.DAT: RLPH1-1
PFLAG: 3
DULOC: 0 0

Display User Parameters? (Y/N): Y

Antenna Parameter Name	Option or Range	Default Value	Current Value
APPLICATION	SU, SD, EX, ER, SS		SU
ANTENNA TYPE	AG, EC, NB, PN, SN, BN, PA, SA, BA		AG
ANTENNA GAIN, DB	-99.900 TO 99.900		10.000

xxxxPRIU.DAT/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

CH DA108

Device Name : DA108
 Editor Name : FSCSS2
 Creation Date : 28 Mar 85
 Date of Last Use : 1 Apr 85
 Current User : 1 TEST NUKEN
 Descriptor : RLPM1: -1
 3333PRIV.DATA: PELAG: 1
 DULOC: 0 0

Display User Parameters? (Y/N): Y

Demodulator Parameter Name	Option or Range	Default Value	Current Value

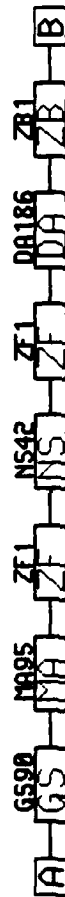
DEMODULATOR TYPE			
BP, DP, OP, OO, BP, 16, FS, MS, CP, AP, PN, FH, PF			
FREQUENCY, MHZ	100000.000		BP 8000.000
TYPE-TIMING LOCK LOOP	DF, PU		DF 0.000
BANDWIDTH-TIMING LOCK LOOP, MZ	1000000.000		0.707
DAMPING FACTOR-TIMING LOOP	0.010 TO 9.990	0.707	2
TYPE-PHASE LOCK LOOP	DF, PU		0.000
ORDER-PHASE LOCK LOOP	2, 3		0.707
BANDWIDTH-PHASE LOCK LOOP, MZ	1000000.000		0.000
DAMPING FACTOR-PHASE LOOP	0.010 TO 9.990	0.707	NO NO
AGC-TIMING & PHASE LOCK LOOPS LIMITATION AT ZERO DBU	VE, PL, NO VE, NO		HA ID
MINIMUM SIGNAL LEVEL, DBU	-200.000 TO 0.000		0.000
DECISION TYPE	HA, SO		
DETECTOR TYPE	ID, FS		

3333PRIV.DATA/TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

PHASE II ACCEPTANCE TESTS 7 AND 8 MSK

AT 7 & 8 MSK
XT117



```

Enter FSCSS Command: SH SV83

System Name      : SV83
Editor Name      : D0922
Creation Date    : 4 Mar 85
Date of Last Run/Restart : 28 Mar 85
# of Transmit Terminals : 1
# of Receive Terminals : 0
# of Satellites : 0
# of Transmission Paths : 1

SV83 Descriptor: AT 7 & 8 MSK

Xmit Recv      Transmission
# Elem Code Path Devices
1 XT117 0 Bt (None)

Display Associated Device Linkage? (Y/N): Y

Orig Device      Dest Device
# Elem Position Elem Position
1 XT117 1AB1 XT117 1AB7
2 XT117 1AB2 XT117 1AB6

xxxxPRIU.SYST: Display Simulation Status Fields? (Y/N): N

Enter FSCSS Command: SH XT117

Element Name      : XT117
Editor Name      : D0922
Creation Date    : 4 Mar 85
Date of Last Use : 4 Mar 85
Current Usage    : 2
Number of Segments : 1

XT117 Descriptor: AT 7 & 8 MSK

Seg Dev
# Code Count Devices
1 AB 7 GS00-NA95-ZF1-NS42-ZF1-DA186-291

Enter FSCSS Command:

xxxxPRIU.DATA: RLPNT: -1 PFLAG: 6
SYNTR: 343

Linkage Specification : BT
TMA "Devices" : (None)
Demand Access "Devices" : (None)

xxxxPRIU.DATA: RLPNT: -1 PFLAG: 2
Latitude : 0 Deg 0 Min N
Longitude : 0 Deg 0 Min E
Altitude : 0.000 Kilometers

```

Enter FSCSS Command: SH GS90

Device Name : GS90
Editor Name : D0922
Creation Date : 4 Mar 85
Date of Last Use : 8 Mar 85
Current Uses : 3
Descriptor : TEST MSK AT768
3333PRIU.DAT: RLPM: -1
PFLAG: 3
DULOC: 0 0

Display User Parameters? (Y/N): Y

Data Source Parameter Name	Option or Range	Default Value	Current Value
3333PRIU.TEST: SOURCE TYPE	IG,EX,AG,AI	IG	IG
DATA RATE,KBPS	1000000.000		1000.000

3333PRIU.DAT:TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command: SH MA95

Device Name : MA95
Editor Name : D0922
Creation Date : 4 Mar 85
Date of Last Use : 8 Mar 85
Current Uses : 2
Descriptor : TEST 768
3333PRIU.DAT: RLPM: -1
PFLAG: 2
DULOC: 0 0

Display User Parameters? (Y/N): Y

Modulator Parameter Name	Option or Range	Default Value	Current Value
MODULATOR TYPE	BP,OP,OG,RS,DP, SP,IS,AP,FS,CP, PH,FH,PF,CU,FM, PU		RS
FREQUENCY, MHZ	0.001 TO 100000.000		100.000

3333PRIU.DAT:TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

Enter FSCSS Command: SM NS42

Device Name : NS42
Editor Name : D0922
Creation Date : 28 Mar 85
Date of Last Use : 4 Mar 85
Current User : 1
Descriptor : TEST MSK AT SA
3333PRIU.DAT: RLPM: -1
PFLAG: 1
DULOC: 0 0

Display User Parameters? (Y/N): Y

Noise Source Parameter Name	Option or Range	Default Value	Current Value
TYPE OF NOISE	TE SA	TE	TE
EFFECTIVE NOISE TEMP,K	0.000000E+00 TO 1.000000E+23		2.290000E+16

3333PRIU.DAT:TEST: DISPLAY ALL FIELDS? (Y/N): N

Enter FSCSS Command:

Enter FSCSS Command: SH D0186

Device Name : D0186
 Editor Name : D0522
 Creation Date : 8 Mar 85
 Date of Last Use : 8 Mar 85
 Current Uses : 2
 Description : TEST 7
 SSSPRIU.DAT: RLNT: -1
 PFLAG: 2
 DULOC: 0 0

Display User Parameters? (Y/N): Y

Demodulator Parameter Name	Option or Range	Default Value	Current Value

DEMODULATOR TYPE	BP, DP, OP, OQ, SP, 16, FS, MS, CP, AP, PN, FN, PE		MS
FREQUENCY, MHZ	0.001 TO 100000.000		100.000 DF
TYPE-TIMING LOCK LOOP BANDWIDTH-TIMING LOCK LOOP, MZ	DF, PU 0.000 TO 1000000.000		0.100
DAMPING FACTOR-TIMING LOOP	0.010 TO 9.990	0.707	0.707 DF 2
TYPE-PHASE LOCK LOOP ORDER-PHASE LOCK LOOP BANDWIDTH-PHASE LOCK LOOP, MZ	DF, PU 2, 3 0.000 TO 1000000.000		10.000
DAMPING FACTOR-PHASE LOOP	0.010 TO 9.990	0.707	0.707 NO NO
ACC-TIMING & PHASE LOCK LOOPS LIMITATION AT ZERO DBU MINIMUM SIGNAL LEVEL, DBU	VE, PL, NO VE, NO -200.000 TO 0.000		0.000 SO ID
DECISION TYPE DETECTOR TYPE	NA, SO ID, FS		

SSSPRIU.DAT:TEST: DISPLAY ALL FIELD5? (Y/N): N

Enter FSCSS Command:

END

FILMED

8-85

DTIC